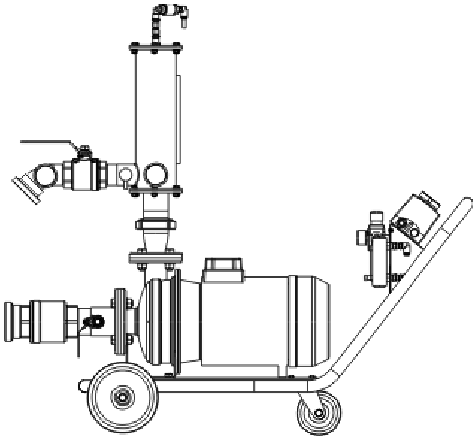
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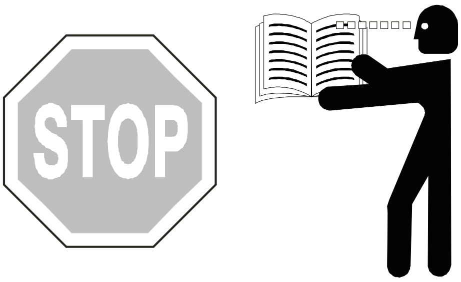


Eco-Flot
Use and maintenance instructions

DELLA TOFFOLA

Eco-Flot_0408R02EN

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Read all the following safety recommendations very carefully before undertaking any action whatsoever with your machine.

FIRST LEARN AND THEN ALWAYS FOLLOW ALL THE SAFETY RECOMMENDATIONS

Read these safety recommendations very carefully before installing and using the machine.

Also read all the explanatory and warning signs attached to the machine itself. Make sure that they are always easy to read, replacing any damaged or missing signs without delay.

Read this manual carefully before using the machine to make sure that you are thoroughly familiar with how it works and all the controls.

Never postpone learning this important information until you are already working with the machine.

Never allow any unauthorized persons unfamiliar with the equipment to come into the vicinity or operate the machine.

Always keep this manual readily available so that anyone taking action on the machine can refer to it.

If the machine is sold or transferred to third parties, it is compulsory to hand over all the related technical documentation, use and maintenance

EXPLANATION OF THE SYMBOLS

Several symbols are used in this manual and on the machine itself to accompany hazard warnings and safety recommendations.
These warnings and recommendations serve primarily to ensure the safety of Installers, Technicians and Operators, but also to avoid the machine being damaged.

THIS SYMBOL IS USED TO DRAW YOUR ATTENTION TO THE RISK OF FATAL ACCIDENTS, SEVERE INJURIES AND EXTENSIVE DAMAGE IN THE EVENT OF THE SPECIFIED SAFETY MEASURES BEING DISREGARDED.
THIS SYMBOL DRAWS ATTENTION TO RISKS OF A GENERAL NATURE.

THIS SYMBOL IS USED TO DRAW YOUR ATTENTION TO THE RISK OF FATAL ACCIDENTS, SEVERE INJURIES AND EXTENSIVE DAMAGE IN THE EVENT OF THE SPECIFIED SAFETY MEASURES BEING DISREGARDED.
THIS SYMBOL DRAWS ATTENTION TO RISKS DERIVING FROM THE PRESENCE AND USE OF ELECTRICITY.

IMPORTANT
This word is used to identify paragraphs in the manual containing essential information concerning the machine. Read the related information

DEFINITIONS

The following are definitions of the individual and legal entities involved in handling and using the machine.

OWNWER: In this user manual, the OWNER is the legal representative of the company or body, or the individual, that purchased the machine. The Owner is responsible for ensuring compliance with all the safety requirements specified in the present manual and in the current legislation in the country where the machine is installed. This last aspect is waived if the Owner appoints a plant MANAGER, who thus takes responsibility for implementing the safety recommendations and for compliance with the safety standards relating to the use of the machine and relations with the OPERATOR.

INSTALLER: In this user manual, the INSTALLER is the legal representative of the company appointed by the OWNER to install and connect the machine to the hydraulic, electrical and compressed air supply networks (etc.) at the plant. The Installer is responsible for correctly handling and installing the machine in compliance with the recommendations of this manual and with the current legal requirements in the country where the machine is used.

OPERATOR: In this user manual, the OPERATOR is the person authorized by the OWNER or MANAGER to take all action on the machine for its usage, adjustment, control and routine servicing, as detailed in this manual (with which Operators must strictly comply, limiting their action to the explicitly allowable procedures).

TECHNICIAN: In this user manual, the TECHNICIAN is the person directly authorized by the Manufacturer or, failing this (and entirely under the latter's responsibility), by the Manufacturer's Dealer in the various European Community states outside Italy, to carry out all extraordinary servicing procedures, as well as any adjustments, tests, repairs and replacements of parts proving necessary during the working life of the machine.

GENERAL SAFETY RECOMMENDATIONS

- In unloading the machine on arrival, lifting and positioning it at the workplace, and all other handling procedures, comply scrupulously with the recommendations of the relevant section of this manual.

Pay particular attention when handling wheel-mounted machines, which have to be moved by hand once they are on the ground.
To prevent any risk of crushing, only move the machine by pushing it, never by pulling it, so that nobody can ever come to be in the path of the machine as it moves. Anyone handling the machine must be supervised by another person uninvolved in the procedure, who shall keep a constant watch to ensure that no obstacles or persons get in the machine's way and no other hazardous situations occur. This supervisor must promptly alert the person moving the machine of any hazards so that the machine can be stopped immediately.

- The surface on which the machine slides, like the surface on which it is used, must meet all the essential safety requirements: it must be perfectly horizontal and smooth, with nothing to interfere with the machine's movements. Check in advance to ensure that the whole distance to cover with the machine meets all the above-mentioned requirements. Make sure that the sliding and supporting surfaces have a load-bearing capacity sufficient to withstand the weight of the machine both empty and in use. Any discontinuity in the floor, e.g. expansion joints, grids and manholes, must meet the specified requirements.
- Never, for any reason whatsoever, lift the machine by any hoisting points other than those indicated.
- Before the machine is used, it must always be immobilized using the fixing devices provided.
- The machine must be placed in an area accessible only to the OPERATORS and TECHNICIANS; failing this, it must be protected by a barrier situated at least 2 m away from its outer edge. OPERATORS and TECHNICIANS may access the area where the machine is used providing they are adequately clothed and equipped with the personal protective equipment specified by law (safety shoes, gloves, helmet, etc.). The INSTALLER's personnel, or any visitors, must always be accompanied by an OPERATOR. Unauthorized personnel must never be allowed to remain alone in the vicinity of the machine. The place of installation must be made inaccessible to children.
- OPERATORS shall restrict themselves to taking action on the machine's controls, so they must not open any of the panels, except for the one for accessing the controls (if any).
- The INSTALLER shall restrict himself to taking action on the connections between the plant and the machine, so he must not open any panels, or operate any controls.
- In all handling, usage, servicing or repairs on the machine, it is compulsory to comply with all current safety standards in the country where the machine is used. This applies both to the equipment and to the operating methods adopted.
- Always disconnect the electric power supply before taking any action to install, service, repair or move the machine. This is of fundamental importance to prevent the risk of death, severe injury and extensive damage to the plant.
- In certain stages of normal use, some of the containers comprising the machine are under pressure (e.g. the filter vessel, plenum chamber, erosion-type dosing units, etc.). Never open such containers or remove any components connected to them before you have completely vented said pressure. Venting must be done through the valves provided on the machine specifically for this purpose.
- Never move the machine during normal working cycles.
- Before each new working cycle, make sure that any mobile electric connections (power cords, plugs, etc.) are sound and efficient. If they show any signs of damage, repairs must be made only by a specialized TECHNICIAN.
- Never take any action not mentioned in this manual under your own initiative.
- Connect the machine to the mains electric power supply according to the recommendations of this manual.
- Before starting the machine, check the efficiency of the earthing for the electric circuitry and machine frame or structure.
- Never use power cords of inadequate cross-section or provisional connections, not even briefly, and certainly not in the event of an emergency.
- Start the machine only after you have made sure of its perfectly safe connection to the systems providing the energy and anything else it needs to function properly (mains electricity and water, compressed gas supply, water drainage network, etc.).
- Keep a safe distance from any mechanical parts in motion.
- Immediately report any alarms or the tripping of any automatic machine safety devices to the TECHNICIAN.
- Never manually reset the machine after an alarm or an automatic safety device has been tripped without first identifying and dealing with the problem that caused them.
- Never remove the guards over moving parts while the machine is in operation.
- Before starting the machine, make sure all guards are correctly installed.
- Routinely perform all the scheduled servicing operations.
- Dispose of the packaging material for the machine at a suitable landfill, taking particular care over any film and plastic bags, which can expose children to the risk of suffocation.
- Never release the processing waste deriving from the working process directly into the environment.

REGULATIONS FOR USING THE MACHINE IN THE FOODSTUFFS SECTOR

The following considerations apply only to machines used with foodstuffs, i.e. destined to come into contact with products for human consumption:

- The machine in your possession has been designed and built to make it suitable for contact with foodstuffs, and fluids in particular. If in doubt about the intended uses of your machine, refer to the relevant chapter in this manual.
- For logistic reasons related to the phases prior to its use (e.g. transport to the user's premises, storage in warehouses, etc.), it is impossible to guarantee the delivery of the machine in conditions suitable to enable its immediate use without an accurate, preliminary sanitization. This is the responsibility of the end user, who may have to comply with any established protocols, e.g. HACCP.

DEMOLITION AND DISPOSAL OF THE MACHINE

- At the end of its working life, the machine must be demolished and disposed of.

- THE MACHINE MUST ONLY BE DEMOLISHED AND DISPOSED OF BY ADEQUATELY-TRAINED AND PROPERLY-EQUIPPED PERSONNEL IN COMPLIANCE WITH THE FOLLOWING PROCEDURE.
- 1. Divide the machine into its constituent parts, separating the materials it is made of:
  - mechanical parts (reducers, pump bodies, etc.);
  - metal parts (structure, piping, etc.)
  - electrical parts;
  - rubber parts;
  - plastic and synthetic parts.
- 2. All resulting materials must be treated and disposed of in accordance with the legal requirements in the country where the machine is used.
- 3. All components contaminated by oil and oily residues must be considered as special waste and disposed of by authorized consortiums. The same applies to the lubricants that periodically have to be changed.
- 4. In the event of the machine being placed out of commission, even only temporarily, it must be stored in an area inaccessible to children. All circuit breakers and isolators must be segregated and disconnected.
  Make a thorough check and release any built-up residual energy, e.g. liquids or gases under pressure inside containers or piping. The machine must also be checked from the static standpoint, to eliminate the risk of any single machine parts moving unexpectedly.
- THE MANUFACTURER ACCEPTS NO LIABILITY FOR DAMAGE TO PERSONS OR PROPERTY DUE TO THE RE-USE OF SINGLE MACHINE PARTS FOR ANY OTHER THAN THE ORIGINAL PURPOSES OR IN OTHER ASSEMBLY CONDITIONS.

INSPECTION OF THE GOODS ON RECEIPT

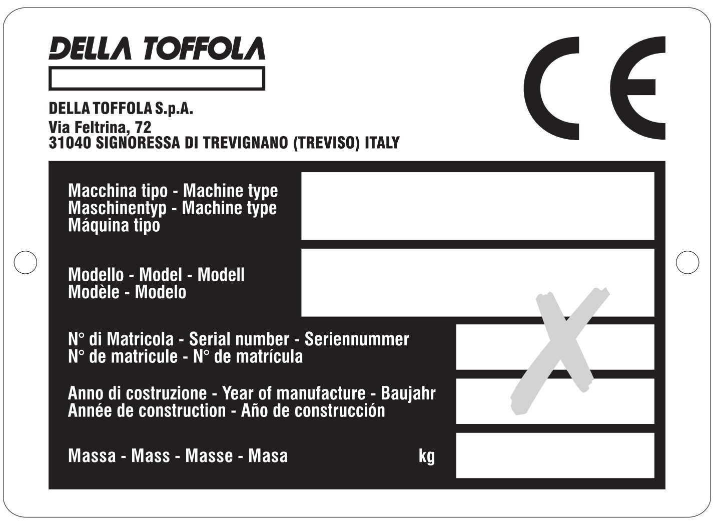
When it is delivered, the machine must be checked by the Customer to identify any signs of damage that it may have suffered in transit and ensure that the machine is complete in every part, as listed on the order form.
If there are signs of damage, make an immediate note of the anomalies detected on the transport document (delivery note or CMR), adding the wording “RECEIVED WITH RESERVE DUE TO EVIDENT DAMAGE TO THE MACHINE”. Delivery ex works includes insurance coverage for any damage in accordance with the Italian law 450 of 22.08.1985 "Compensation limit". In the event of complaints, the Customer must be able to produce an adequate photographic documentation of the most obvious damage.

GUARANTEE

The Manufacturer guarantees the machine for the period indicated in the order form.
The GUARANTEE consists exclusively in the replacement or repair, free of charge, of any parts acknowledged as being defective.
The GUARANTEE does not cover electrical parts.
The GUARANTEE is valid only if all installation and usage instructions have been followed (not only those stated by the Manufacturer, but also those suggested by current practice).
The GUARANTEE becomes null and void in the event of any servicing procedures being undertaken by personnel not authorized by the Manufacturer. If the machine alarm sounds or one of the automatic safety devices is tripped, the machine must not be reset manually until the cause of the shutdown has been dealt with. Repeated manual resets can be sufficient reason for the Guarantee to become null and void.
The GUARANTEE is valid providing any flaws or defects are reported within eight days of their detection; moreover, the GUARANTEE takes effect providing the use of the machine was suspended immediately after the fault was discovered.

AFTER-SALES ASSISTANCE

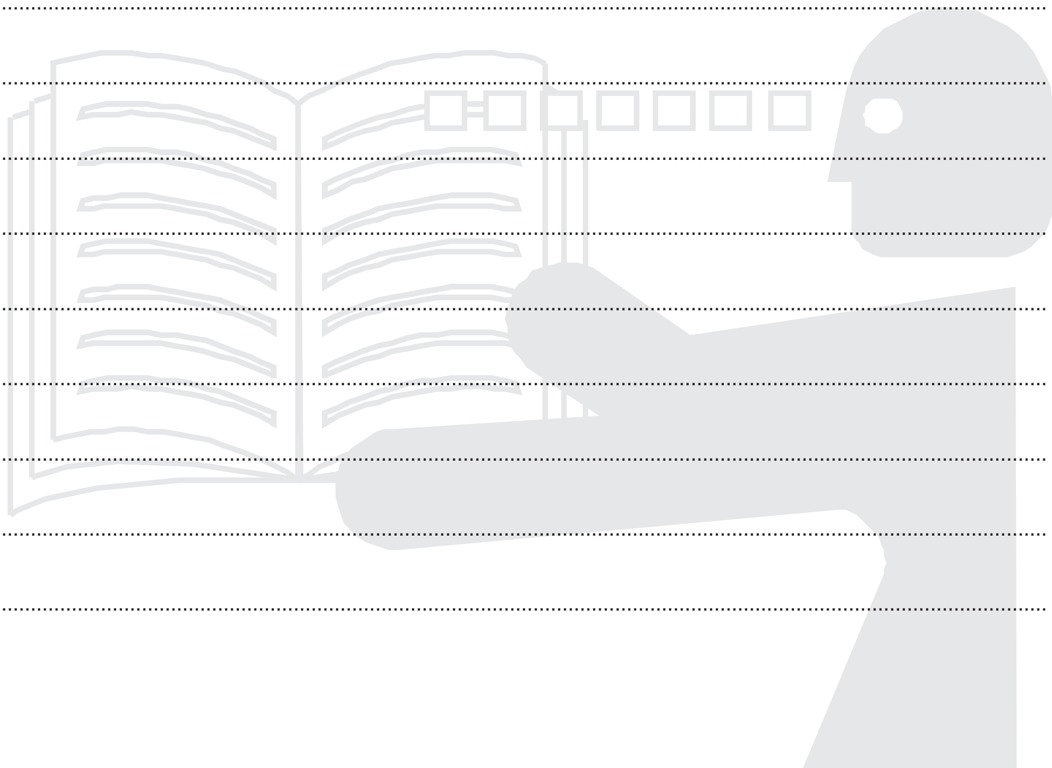
When requesting any information, servicing, or other services, it is essential to specify the SERIAL NUMBER of your machine.
It is impossible to provide accurate instructions or schedule servicing measures unless this information is provided.



RECOMMENDATIONS FOR PROTECTION AGAINST FREEZING

⚠ If there is a danger of the ambient temperature dropping to 0°C / 32°F, be sure to empty any liquids (water or product to treat) from all of the machine's hydraulic circuits to prevent ice forming in the piping and damaging parts of the machine.

NOTES



Contents

ENQUIRIES AND FURTHER INFORMATION:

For any enquiries or further information concerning the use of the machine or the contents of this manual, or for any technical support, please contact the Della Toffola S.p.A. Customer Support Service, using the following references:

Della Toffola S.p.A – Assistance Service

Via Feltrina 72 - 31040, Signoressa di Trevignano (TV) (Italia)

Tel.: +39 0423 6772 Fax: +39 0423 670841

PRESERVATION:

Always keep a copy of this manual near the machine and readily available to the user, and store the spare copy in a safe place.

If the manual is lost or damaged, contact Della Toffola S.p.A. for a replacement.

This manual reflects the state of the machine as at the time when it was developed.

Bear in mind that, in accordance with current legislation, this instructions manual forms an integral part of the machine and must accompany the machine at all times.

DOCUMENT IDENTIFICATION:

Title	Eco-Flot Use and maintenance instructions
File code	Eco-Flot_0408R02EN.doc
Rev. No.:	02 – 12.08

1. General information

1.1. Introduction

This machine has been designed and manufactured to ensure the best possible results in achieving the clarification of grape musts as rapidly as possible, while enhancing the qualities of the end product. The machine is so user-friendly, practical and versatile that it is suitable for use in any wine cellar and will be bound to satisfy a variety of needs.

When using and servicing the machine, always comply scrupulously with the contents of this booklet, which should be read carefully before taking any action to install, use or service the equipment.

It is essential to complete these procedures properly and to monitor the product entering and leaving the machine in order for it to satisfy your needs and ensure an excellent performance.

Before taking any action on the machine, it is essential to make sure that operators are capable of completing all the procedures described in this manual and that they know how to repeat them as and when necessary.
Always keep the user manual readily available when taking action on the machine.
Special attention must be paid to the safety recommendations concerning the use of the machine. A proper understanding of and compliance with these recommendations is fundamental to operator safety.

The manufacturer accepts no liability for any damage caused directly or indirectly to persons or property as a result of failure to comply with the recommendations in this user manual.

1.2. Considerations on the instructions

Due to the numerous variables that can affect the grape must clarifying process, it is extremely difficult to provide unequivocal recommendations on the best way to complete the various procedures. However, once you have gained a little experience of using the machine, it will soon become evident that its great potential for satisfying your every need in use with a variety of products.

a) This manual contains instructions for the standard version of the equipment and it may be that the machine in your possession does not include some of the components illustrated here, or that said components are arranged differently from those described in the manual, without this affecting the efficiency and performance of the equipment in any way

b) When working with the machine, carefully follow the instructions concerning the operation of the valves and taps.

   Operating errors or taking action other than as specified in this manual may have undesirable effects on the end product.

1.3. General safety recommendations

- It is forbidden for any unauthorized personnel to use the machine.
- It is forbidden for any persons under the influence of drugs, alcohol or medication affecting the speed of their reactions to assemble, commission, control, service or dismantle the machine.
- Only use the machine in safe operating conditions.
- Only use the machine for its intended purpose. Any other or improper use cannot assure adequate safety.
- It is strictly forbidden for a person from outside or without authorization to come into the vicinity of the machine when it is functioning.
- It is forbidden for anyone to take independent action or perform maneuvers other than those for which they have been authorized, or that may affect their own or other people's safety.
- It is compulsory for the operator to immediately deal with or report any damage or changes to machine parts that may influence its safety.
- Never dismantle, modify or disable parts of the machine (functional parts, control systems or safety devices).
- In the workplace, it is forbidden to use clothes or personal belongings that, given the nature of the process and the characteristics of the machine, might constitute a hazard for personal safety. Personal clothing worn at the workplace must consequently have no loose parts that may be drawn in by any moving parts.
- Never wear bracelets, necklaces or other objects that may become caught up in moving parts.
- Always use clothing and personal protective equipment as specified in this manual and in the safety standards adopted at the plant.
- The personnel authorized to take action on the machine must use only the equipment provided and appropriate tools (in good working order) for any servicing work they undertake; the specified methods must be scrupulously and constantly followed.
- While at work, personnel must remain in the right position and always avoid exposing themselves to any risk.
- Workstations must be kept clean and tidy; all waste of any kind must be placed in suitable containers.
- It is forbidden to take any steps other than as specified in this manual or without first making the machine safe.
- The responsibilities for the assembly, dismantling and reassembly, commissioning and servicing of the machine must be clearly defined and scrupulously followed.
- Never aim jets of water at the electrical parts of the machine.
- In the event of fire, use dry extinguishers to avoid spreading the flames further.
- In the event of an emergency, every worker must contribute - according to their respective abilities, experience and aptitude – to helping the people appointed to undertake fire prevention, fire-fighting, evacuation, safety and first aid measures.

- Any work on the electrical equipment must be handled exclusively by a qualified electrician.

1.4. General description

Clarifying a grape must prior to its fermentation is a fundamental step in order to obtain wines with the best possible sensory features.

Eliminating the solid particles from the grape must restricts higher alcohol production during the fermentation process and increases the concentrations of esters, consequently enhancing the wine’s aroma and generally improving its quality.

In some cases, clarifying agents (e.g. bentonite, gelatin, silica gel, casein and activated carbon) are used to facilitate and speed up the separation of the solid particles from the grape must, and to reduce its colloid content. All these clarifying adjuvants bind electrically to the solids and colloids, giving rise to a flocculation process.

Clarifying by flotation involves injecting tiny bubbles of gas into the lower portion of the grape must to clarify. As the gas spreads through the fluid, it tends to rise to the surface, entraining the flakes contained in the must.

A compact layer of these solid particles progressively forms on the surface of the product and the clarified fluid can then simply be drawn off from the lower part of the tank.

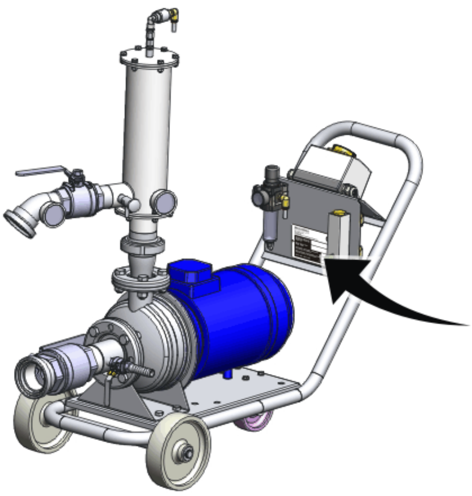
In other words, when the machine receives the must to treat from a feed tank, it saturates the fluid with tiny gas bubbles - sometimes with an added clarifying agent - and then returns the must to the same tank where the separation process can begin.

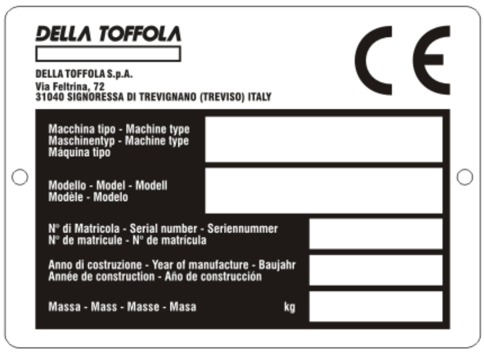
The Eco-Flot machines are all similar from the functional and structural standpoint, the only substantial difference between them being the hourly output of treated product obtainable.

Where necessary, at the customer's request, the machines can be delivered for a powering at a frequency of 50 or 60 Hz.

1.5. Machine identification

The machine is identified by means of a nameplate located as shown in the figure.



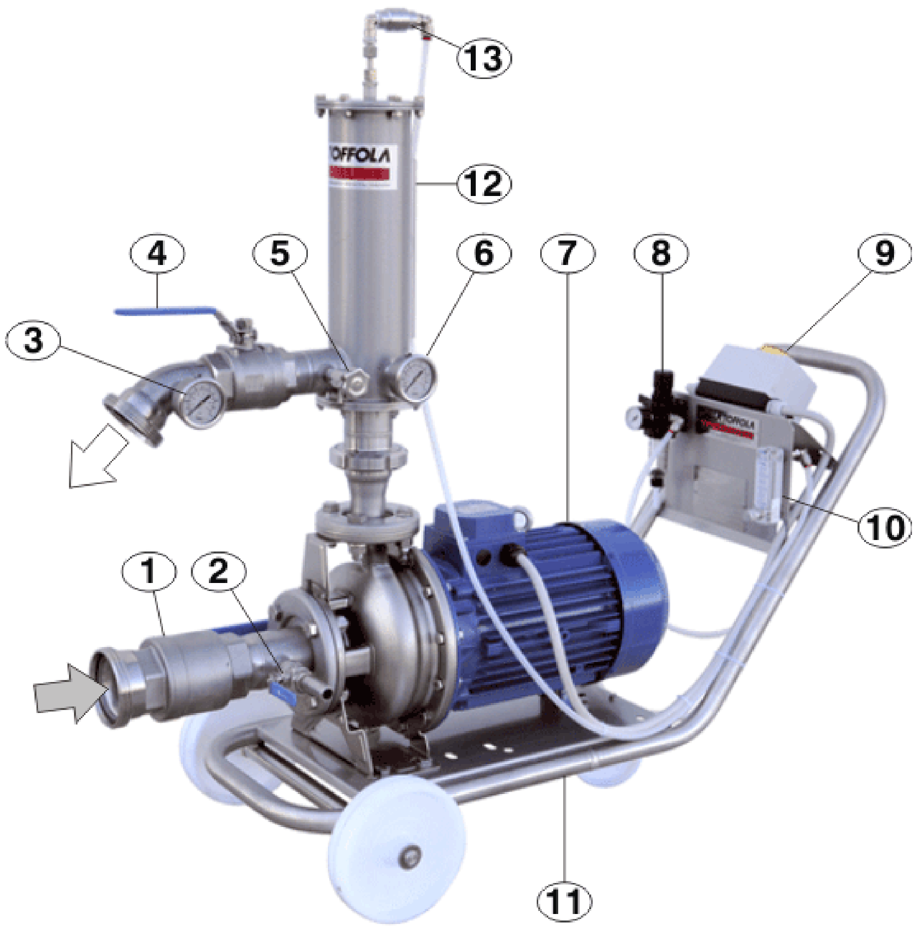


This nameplate must remain intact and clearly legible because it specifies the main characteristics of the machine, i.e.

- the manufacturer's name and address;
- the name of the machine;
- the serial number;
- the year of construction;
- the weight.

1.6. Description of the machine

The Eco-Flot is a compact trolley-mounted unit comprising a centrifugal pump for circulating the must, a unit for delivering the gas (air or nitrogen) and adjusting its flow rate, means for measuring the flow rate of the gas, a valve for delivering flocculation adjuvant and other valves and pressure gauges for adjusting and monitoring the working pressures and flow rates (see figure).



1) *Intake valve*; connect the piping for delivering the product to treat.
2) *Adjuvant intake valve*; connect the piping, if any, for delivering a flocculation adjuvant (liquid or emulsion). By adjusting this valve with the pump running, you can then add the adjuvant to the product being treated.
3) *Counter pressure gauge*
4) *Valve for adjusting the treated product delivery rate*; connect the piping for discharging the treated product into the tank.

5) *Venting tap and sample collector*

6) *Saturation pressure gauge*

7) *Centrifugal pump*

8) *Compressed air or nitrogen delivery and flow adjustment unit*; turn the handle clockwise to increase the pressure or anticlockwise to reduce it.

9) *General on/off switch.*

10) *Gas flow meter*; turn the knob anticlockwise to open the gas flow and adjust the flow rate, which is indicated by the ball sliding inside a graduated channel.

11) *Trolley complete with wheels*

12) *Saturation gas tank*

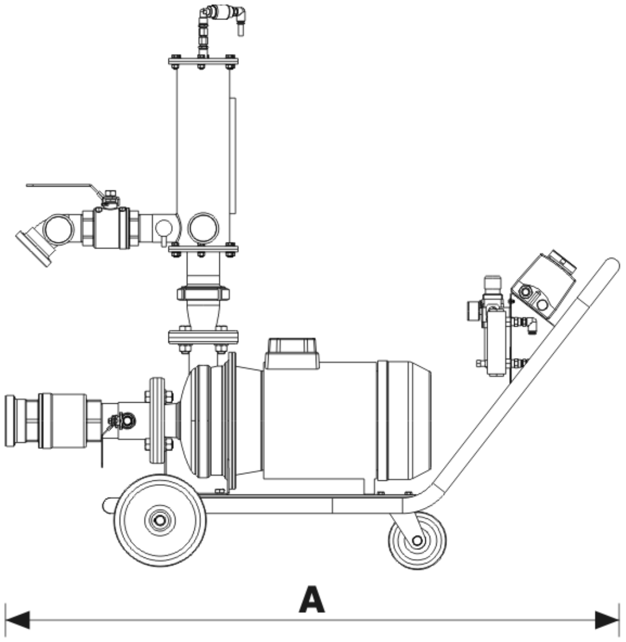
13) *Check valve on the compressed air or nitrogen supply line*

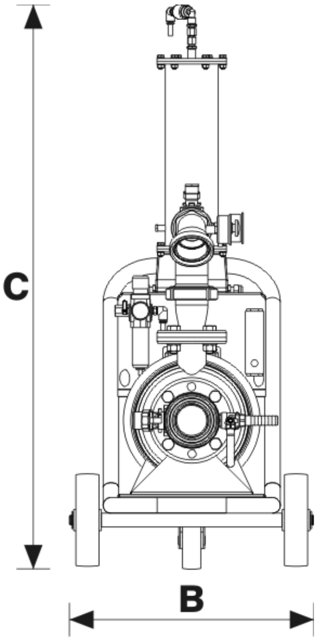
1.7. Intended use

The Eco-Flot is for use in the flotation of white and rosé grape must at ambient temperatures.

In addition to the flotation of grape must, the Eco-Flot is also suitable for use as a normal transfer pump for use with wines and liquid foodstuffs.

2. Technical data table





Eco-Flot model		S1	S2	S3
Rated capacity at 6 bar	m^3/h	13.5	29	42
Mean capacity at 5.5 bar	m^3/h	17	33	51
Gas (air/nitrogen) consumption at 7 bar	m^3/h	0.8	1.6	2.5
Centrifugal pump model		Ebara 32-200/5.5kW	Ebara 40-200/11kW	Ebara 50-200/15kW
Connectors at inlet for product to treat		DN 50	DN 80	DN 80
Connectors at outlet for treated product		DN 50	DN 65	DN 65
Sound pressure level**	dB(A)	75	80	80
Weight	kg	80	110	140
Length* **A**	mm	1215	1330	1370
Width* **B**	mm	530	530	530
Height* **C**	mm	1215	1215	1220

* Dati indicativi/Indicative data/Änderungen vorbeachten/Données indicatives

** Livello di pressione sonora media ad 1 metro di distanza / Mean sound pressure level at a distance of 1meter / Mittlerer Schalldruckpegel auf einem Meter Distanz / Niveau de pression sonore moyenne à 1 mètre de distance / Nivel de presión acústica mediana a 1 metro de distancia.

3. Installation instructions

Prior to delivery, the machine undergoes careful testing and inspection under various working conditions in order to guarantee its smooth operation.
The following recommendations should be followed, however, to ensure its proper, safe installation.

3.1. Lifting and moving the machine

DANGER

Before unloading the machine, make sure that the surface on which it is to stand is capable of supporting its weight.
The floor where the machine is used should have a load-bearing capacity corresponding to the combined weight of the machine and its contents. See the Specifications Table for details.
Also ensure that the means used to unload and move the machine are of suitable load-bearing capacity.

To lift and handle the machine in transit, use belts and a crane.

Take care to ensure that the belts do not come to bear on plastic or other deformable parts, or electric cables.
To lift the machine, proceed as shown in Figure 1

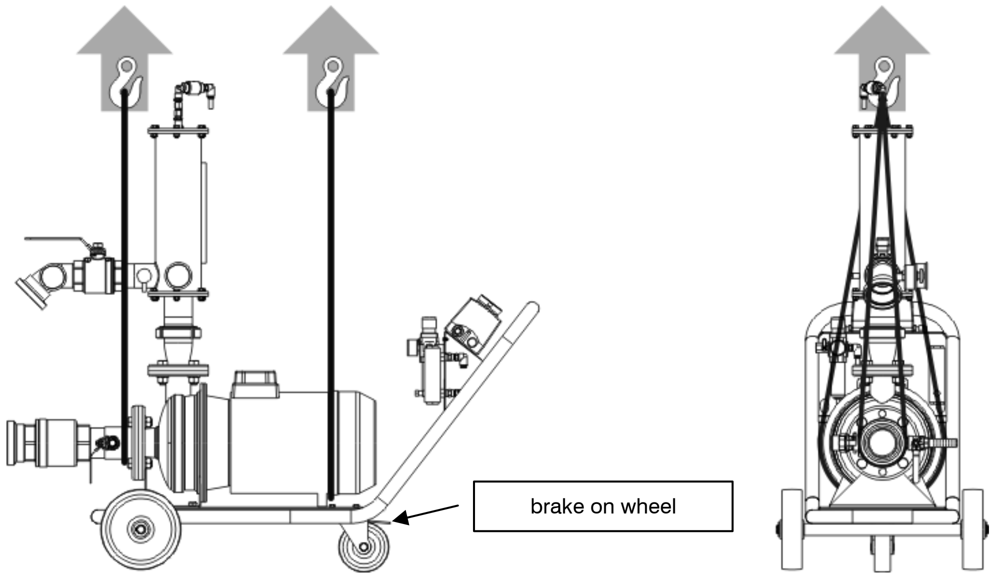


Figure 1

Once it is on the floor, the machine is easy to move because it is mounted on wheels.

IMPORTANT

Once the machine has been positioned in the work place and before it is used, make absolutely sure that it is perfectly stable and that the blocking device (brake on wheel) is enabled.

3.2. Hydraulic connections

The machine must be suitably connected to the tank from where it receives and into where it discharges the product being treated, as well as to the optional connection for a supply of flocculation adjuvant.

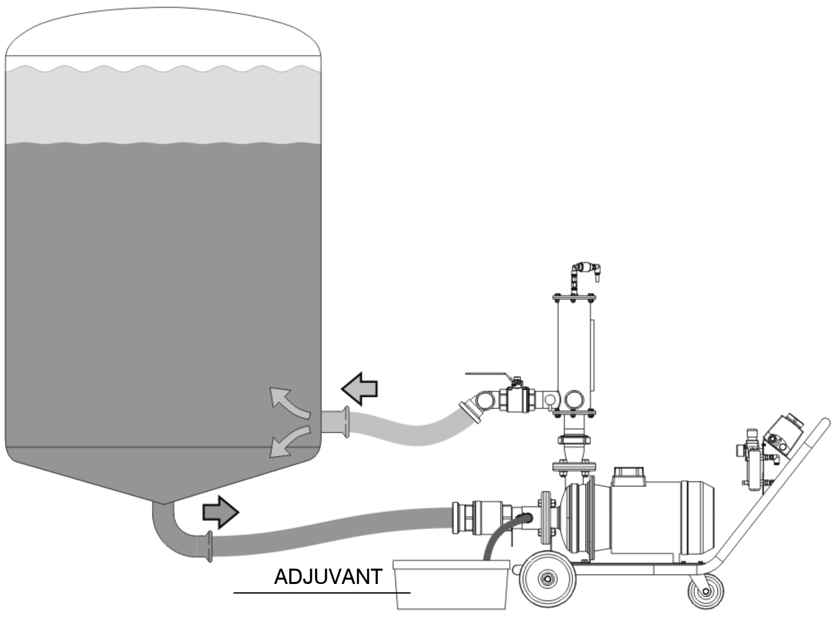
- The pipes used may be flexible (plastic) or rigid (steel).
- Rigid connection pipes should be secured separately from the filter in order to prevent their weight from resting on the inlet and outlet connections.
- Provide flexible joints between the machine and any rigid pipes so as to avoid any mutual transmission of vibrations.
- Pipes should conform to all requirements concerning compatibility with the product being treated (e.g. suitable for foodstuffs or corrosive liquids).
- Pipes must be capable of withstanding the mechanical stress produced by the machine, e.g. they should not be prone to crushing as a result of the suction force of the feed pump.
- They should be of suitable size, i.e. with a diameter proportional to the capacity of the machine and never less than the diameter of the inlet and outlet connections.
- If both flexible and rigid pipes are used, check the tightness of the connections frequently to prevent the machine from sucking in air through any loose connections.

Connect the piping delivering the product to treat to the Eco-Flot to the partial drainage valve on its must tank and the piping for discharging the clarified product to the total drainage valve; the adjuvant supply line, if any, should be connected to the valve **2** (see figure below).

The sizes and types of the inlet and outlet connectors are specified in the technical data table.

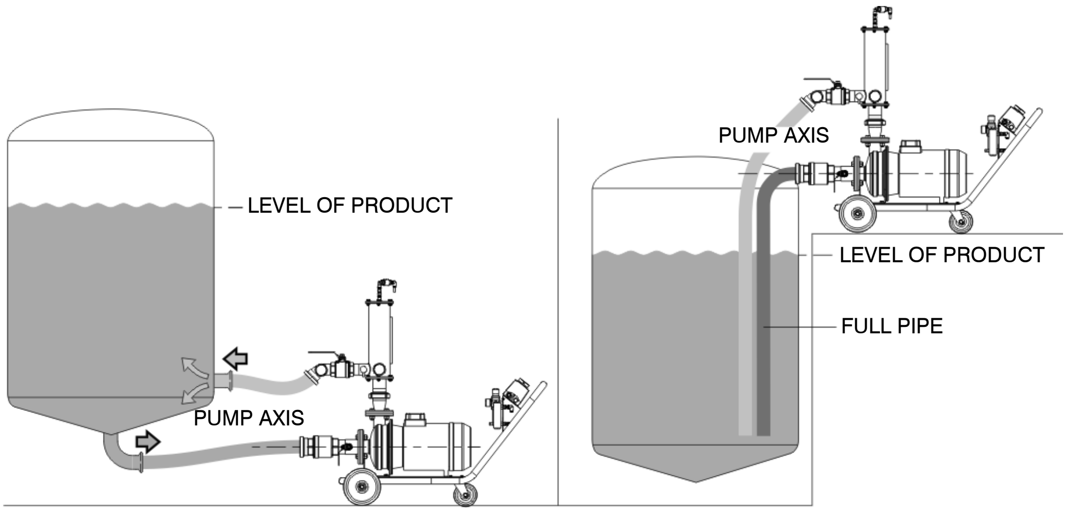
<u>To ensure the proper operation of the machine, the **suction piping** should be kept as short as possible, preferably no more than 3 meters long.</u>

<u>The **delivery piping** should also be kept as short as possible, and preferably no more than 3 meters long</u>.



3.3. Preliminaries

For the machine to function properly, it is essential for the level of the product contained in the tank to be higher than the axis of the pump (FEED UNDER A HYDROSTATIC HEAD (see figure below).



FEED UNDER HYDRSTATIC HEAD FEED ABOVE HYDROSTATIC HEAD

If the level of the product is lower than the pump's axis (FEED ABOVE HYDROSTATIC HEAD), then it is essential to completely fill the suction piping before starting the pump.

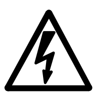
3.4. Electric connections

All the Eco-Flot machines are powered by a three-phase voltage.

Make sure the power supply available at the plant provides electricity with characteristics suited to the machine.

The machine is connected to the mains power supply by means of a factory-fitted power cord and plug.

Make sure, or have an expert check, that the power socket from which the machine is powered is complete with fuses or an automatic thermomagnetic circuit breaker with a capacity no higher than that of the machine.



DANGER

As in the case of any ordinary or extraordinary action taken on the machine's electrical system, the mains connection should be handled by a qualified *TECHNICIAN* and the mains line should conform to current standards (CEI, etc.) and existing legislation.
Bear in mind that it is compulsory to earth the machine.

It is also essential to comply with all safety regulations regarding the room where the machine is installed.

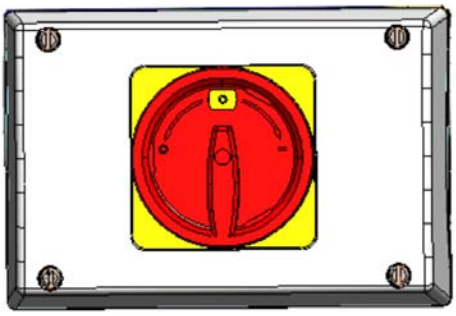
3.5. Checking the cyclic sense of the power phases

After connecting the machine to the mains power supply and before starting to use it, check whether the wiring of the power supply phases has been done correctly.

IMPORTANT
The pump must never be allowed to run dry.
The mechanical seal may be damaged if the pump is allowed to function, even briefly, without any fluid inside it.

Close the valve **2**, open the inlet valve **1** and the outlet valve **4** and wait for a few seconds to allow for the grape must to fill the piping in the circuit and the centrifugal pump. While the circuit is filling, vent the air from inside the system through the sample collector tap **5** and only close this tap again when grape must begins to come out.

Start the centrifugal pump in short pulses by turning the on/off switch **9** briefly to position 1 and make sure that the motor turns in the right direction, generally indicated by a red arrow on the pump.



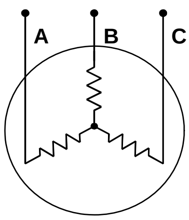
MAIN ON/OFF SWITCH

If the motor is not turning in the right direction, you will need to invert the position of the wiring connecting the machine to the mains power supply.

3.6. Checking the phase balance

Do not operate electric motors if the voltage unbalance between the phases is greater than 3%.
Use the following formula to check the balance:

$$\% \text{ voltage unbalance} = \frac{\text{max. voltage shift from mean}}{\text{mean voltage}} \times 100$$



Example: rated mains voltage 400V 3 ~ 50 Hz

AB = 409V

BC = 398V

AC = 396V

$$\text{mean voltage} = \frac{409 + 398 + 396}{3} = 401\text{V}$$

How to calculate the percentage of unbalance:

$$\% \text{ voltage unbalance } = \frac{409 - 401}{} \times 100 = 1.99\%$$

This value is acceptable because it is less than the maximum allowable, i.e. 3%.

IMPORTANT

If the mains voltage has an unbalance greater than 3%, contact the Electricity Board. Operating the machine with a voltage unbalance between the phases greater than 3% makes the GUARANTEE NULL AND VOID.

The mains power supply must coincide with the rated value ± 10%.

3.7. Connection to the pneumatic system

The Eco-Flot needs to be connected to a supply of compressed air or nitrogen at a pressure of approximately 7 bar.

The gas supply, from bottles or generators, is connected to the coupling on the unit **8**.

If you use compressed air coming from your own generators (compressors), it is always a good idea to install specific air filters (not included in the supply).

DANGER

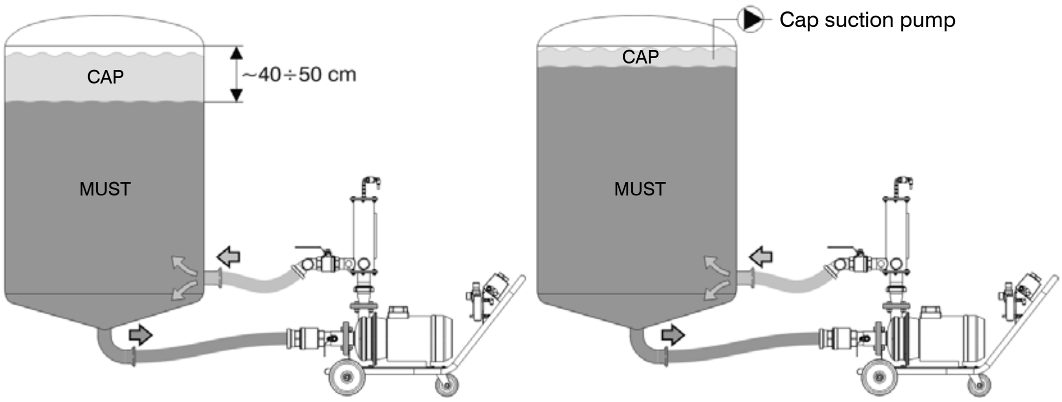
In some stages of normal use, the machine is under pressure.

Never open the machine or remove any machine components before this pressure has been completely vented.

4. Use

4.1. Start-up

Make sure the level of the product contained inside the tank is sufficient to leave at least 40-50 cm of empty space above it to allow for the cap of solid particles to form on the surface of the grape must, otherwise it becomes necessary to routinely draw off the cap with the aid of a piston pump (not included in the supply).



Make sure the product has been treated with a pectolytic enzyme preparation, according to the doses and timing recommended by the manufacturer, so as to achieve a perfect rupture of the pectins.

Make sure the valve **2** has been closed and the inlet and outlet valves **1** and **4** have been opened properly. Wait a few seconds for the grape must to fill the piping in the circuit and the centrifugal pump.

During this filling procedure, vent off the air from inside the circuit through the sample collector tap **5**, closing it again as soon as the must begins to come out.

Check the supply of compressed air or nitrogen to the unit **8** and adjust the pressure to 7 bar.

If you wish to use a flocculation adjuvant, prepare the mixture in a small tank and immerse a suction pipe connected to the valve **2** in the tank, leaving the valve closed.

Close the outlet valve **4**.

Start the centrifugal pump by turning the main switch to position 1 and slowly open the outlet valve **4**.

If you have chosen to add an adjuvant to the must, slowly open the valve **2** and, if necessary, slightly close the must inlet valve **1** if you notice any adjuvant uptake problems. During the suction phase, make sure that the gas supply is cut off and that the outlet valve **4** is adjusted so as to obtain a pressure of 4 bar on the pressure gauge **6.** The must is mixed with the adjuvant during this recirculation phase.

When all the adjuvant has been added, you can begin to treat the product with the gas (air or nitrogen).

4.2. Gas treatment

Slightly close the valve **4** so as to obtain a pressure of 6 bar (as shown on the pressure gauge **6**).

Double check to ensure that the pressures on the gauges are as recommended above, then adjust the gas flow rate by means of the knob on the flow meter **10**.

The gas flow should be adjusted to suit the grape must saturation rate; if, for instance, the saturation rate is 10 m^3/h, adjust the flow meter to 0.25 m^3/h; if the saturation rate is 20 m^3/h, adjust the flow meter to 0,5 m^3/h; and so on.

The working pressures may drop while the gas is being delivered, in which case you will need to restore them to the required settings by taking action on the inlet and outlet valves, and on the adjustment knobs.

The duration of the treatment varies, depending on the capacity of the machine and the type of product being treated.

INDICATIVE REFERENCE TABLE

Eco-Flot S1

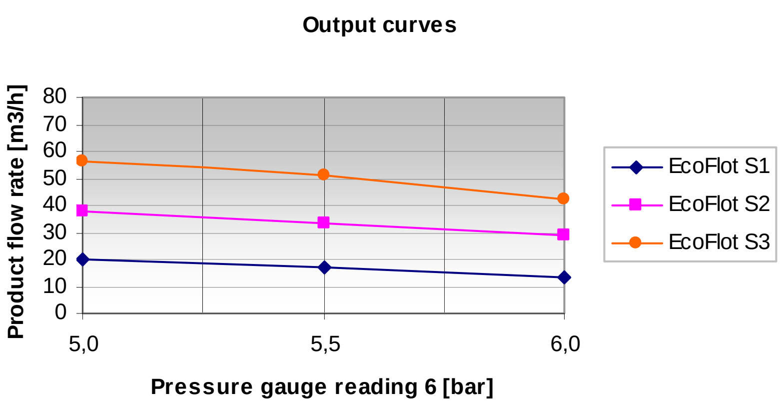
Example of volume for flotation	hl	100	100	100
Minimum pumping over time	min.	30	35	45
Pressure reading on gauge 6	bar	5.0	5.5	6.0
Product flow rate	m^3/h	20	17	13,5
Gas flow rate	m^3/h	0,5	0,42	0.34

Eco-Flot S2

Example of volume for flotation	hl	200	200	200
Minimum pumping over time	min.	30	35	40
Pressure reading on gauge 6	bar	5.0	5.5	6.0
Product flow rate	m^3/h	38	33	29
Gas flow rate	m^3/h	0,95	0,82	0,72

Eco-Flot S3

Example of volume for flotation	hl	300	300	300
Minimum pumping over time	min.	32	35	43
Pressure reading on gauge 6	bar	5.0	5.5	6.0
Product flow rate	m^3/h	56	51	42
Gas flow rate	m^3/h	1,4	1,27	1,05



Monitor the efficiency of the clarification process by collecting a sample of product in a glass container from the tap **5**. If the process is going smoothly, there should be a visible separation of the lees.

When the treatment has been completed, close the gas supply, switch off the machine, close the inlet and outlet valves **1** and **4**, vent off the residual pressure through the tap **5** and disconnect the piping.

4.3. Lees separation

The phase in which the lees are separated from the grape must demands no action or monitoring on the part of the operator. This phase consists of the interval during which the gas bubbles rise to the surface, carrying the lees with them and forming the cap on top of the must.

How long this interval lasts depends on the height of the tank. It is generally assumed that you should allow an hour for each meter of the tank's height.

You can also wait for less than the above-suggested interval, in which case the lees will be less concentrated; waiting a longer time will increase the concentration of the lees without posing any risk of the cap dropping back into the must (providing the fermentation process has not begun in the meantime).

4.4. Transfer

Once the separation phase has been completed, you can draw off the clarified mast. To do so, first attach a sight glass on the valve for completely draining the tank.

Because the flotated solids will have risen to the top of the tank, you simply need to draw off the clarified must through the total drainage valve up until the sight glass shows the first signs of the passage of the flotated solids.

Then close the valve, change the piping and discharge the lees into a separate collection tank.

5. Cleaning and servicing

To keep the machine in perfect and efficient working order, you need to perform a few simple cleaning and servicing procedures.

DANGER
Pay the utmost attention when cleaning the machine manually with the aid of liquids. Always disconnect the pump from the mains power supply before aiming jets of water at any part of the machine.

1) At the end of each treatment cycle, or when the machine's performance deteriorates, you need to clean the machine, the piping and the tanks thoroughly with clean water at approximately 30°C/86°F, possibly adding some citric acid. Run the machine and allow the solution to circulate for 10-15 minutes in order to eliminate all traces of solid residues.

2) If the pump becomes severely clogged, run a counterflow washing cycle, sending water under high pressure through the valve **4**.

3) Before setting the machine aside for any lengthy period of time, disconnect the electric power supply and completely empty any residual liquids from the machine by unscrewing the knob situated on the underside of the pump.

6. Troubleshooting

This section deals with certain anomalies that may be encountered during the normal use of the machine.

DANGER
When taking any action on the machine, always comply with the previously-mentioned safety recommendations.

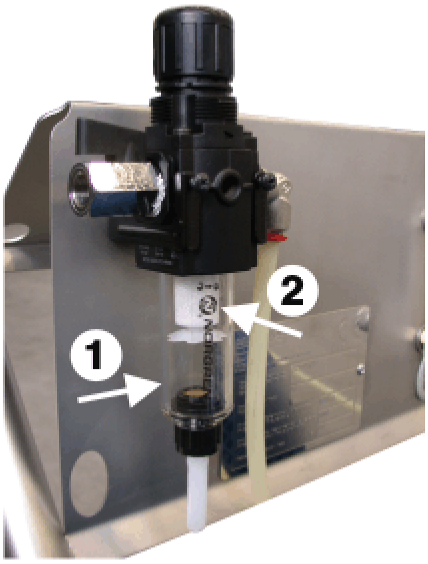
Do not take any action other than as envisaged in this user manual.

All action must be undertaken exclusively by specialized, suitably-qualified personnel (*INSTALLERS, OPERATORS, ENGINEERS,* etc).

1. THE WORKING PRESSURE FAILS TO BUILD UP

- Make sure the pump is turning in the right direction.
- Make sure there is no air in the circuit and, if necessary, vent off any air through the tap **5**.
- Clean the piping and the machine as explained in section 4, item 1, because it may have become clogged.
- Make sure the filter in the gas supply unit **8** has not become clogged; to do so:
  - disconnect the compressed air supply;
  - turn the container 1 anticlockwise (see figure below) and remove it;

- empty out any condensation and wash the container with water;
- dismantle the filter 2 by turning it anticlockwise;
- accurately clean the filter 2 or replace it with a new one;
- reinstall all the components.



- If the problem persists, contact the manufacturer's customer support service.

2. THE PUMP'S EFFICIENCY DETERIORATES.

The pump has become clogged with skins or other solid matter.

- Run a counterflow washing cycle with water under high pressure.
- Avoid sucking the product from the bottom of the tanks when the product being treated contains considerable quantities of solids in suspension.

3. PROBLEMS WITH THE UPTAKE OF ADJUVANT

- Make sure the suction pipe has not become clogged.
- Reduce the working pressure by slightly closing the intake valve **1**.

4. UNSATISFACTORY SEPARATION OF THE GRAPE MUST FROM THE LEES

- Make sure that all the recommended working pressures and gas flow rates have been scrupulously maintained throughout the treatment (during the treatment, it is a good idea to monitor and restore these working parameters).
- Make sure the specified treatment times and separation time have been complied with.
- Make sure the grape must is not fermenting.
- Make sure the must has been treated with the right quantity of enzymes and for the time specified by the supplier.
- The temperature of the must may be too low, making it necessary to increase the gas flow rate. The ideal temperature of the grape must is around 18-25°C/64.4-77°F.
- If all these tests fail to solve the problem, contact the manufacturer's customer support service.

EBARA MOTOR-DRIVEN PUMPS

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INSTRUCTION MANUAL REGARDING USE AND MAINTENANCE PART 1
TO BE KEPT BY THE USER

1. INTRODUCTION

This instruction manual is made up of two parts: PART 1 which contains general information regarding all our production and PART 2 which contains specific information regarding the motor-driven pump that you have purchased. The two booklets are complementary to each other, therefore make sure that you have both of them.
Follow the instructions given in these booklets in order to obtain optimum return and operation from your motor-driven pump. If any other information is necessary, please contact the nearest authorised retailer.
If the booklets contain contrasting information, keep to what is indicated in PART 2 (product specifications).

THE REPRODUCTION, EVEN PARTIAL, OF THE ILLUSTRATIONS AND/OR TEXT HEREIN IS FORBIDDEN.

The following symbols are used throughout the instruction booklets:

WARNING!	**Risk of damaging the pump or the system**
	Risk of injuring people or damaging things
	Risks of an electrical nature

2. CONTENTS

3. MANUFACTURER IDENTIFICATION DATA

3.1. MANUFACTURER DATA

EBARA PUMPS EUROPE S.p.A.
Plant management:
Via Pacinotti, 32 - 36040 BRENDOLA (VI) ITALY
Telephone: 0444/706811 - Telefax: 0444/706950 - Telex: 480536
Registered office:
Via Campo Sportivo, 30 - 38023 CLES (TN) ITALY
Telephone: 0463/660411 - Telefax: 0463/422782

3.2. MOTOR-DRIVEN PUMPS

See plates in FIG. 6:	6.1 for motor-driven surface pumps
	6.2 for submersible motor-driven pumps

For product type, see PART 2.

4. GUARANTEE AND TECHNICAL ASSISTANCE

THE GUARANTEE IS RENDERED NULL AND VOID IF THE INSTRUCTIONS GIVEN IN THIS BOOKLET ARE NOT ADHERED TO AND/OR IF ANYONE OTHER THAN PERSONNEL FROM OUR HELP CENTRES INTERVENES ON THE MOTOR-DRIVEN PUMP. IN THESE CASES, THE MANUFACTURER IS RELIEVED FROM ALL RESPONSIBILITY REGARDING INJURY TO PEOPLE AND SUBSEQUENT DAMAGE TO ADJACENT ITEMS AND/OR THE MOTOR-DRIVEN PUMP ITSELF.

Once you have received the motor-driven pump, make sure that the packaging is not broken or seriously damaged. If it is, immediately inform the person who delivered it. After extracting the motor pump from its packaging, make sure that it was not damaged during transportation. If it has been, inform the retailer within 8 days from delivery. Check the motor-driven pump plate to ensure that the indicated characteristics are those requested by you.

The following parts, being normally subject to wear, have a limited guarantee:

- bearings
- mechanical seals
- grommets
- capacitors

If a fault that is not listed in the “TROUBLESHOOTING” table (chapter 10.1.) occurs, please contact the nearest authorised retailer.

5. GENERAL SAFETY WARNINGS

Before starting the motor-driven pump, the user must follow the operations indicated in this manual (PART 1 and PART 2), and apply them each time the motor-driven pump is used or when maintenance is carried out on it.

5.1. PREVENTIVE MEASURES TO BE TAKEN BY THE USER

Users must observe the accident prevention regulations that are in force in their countries at the time. They must also pay attention to the motor-driven pump characteristics (see “TECHNICAL DATA” in PART 2).

While repairing or carrying out maintenance on the motor-driven pump, disconnect the electric supply. Doing this avoids accidental starting, which could injure people and/or cause damage.

Any maintenance, installation or handling carried out on the motor-driven pump while it is still being powered can seriously injure, or even kill, people.

When starting the motor-driven pump, users must ensure that their feet are not bare or, worse, immersed in water. They must also ensure that their hands are not wet.

Users must not operate or carry out any work on the motor-driven pump that is not permitted in this manual.

5.2. IMPORTANT PROTECTIONS AND CAUTIONS

All motor-driven pumps are designed in such a way that all moving parts are made safe by using guards. The manufacturer declines any responsibility in the event of damages caused by the removal of said protections.

Each conductor or powered part is electrically insulated with regards to earth. Extra security is also added by connecting the accessible conducting parts to an earth conductor. This ensures that accessible parts cannot become dangerous should the main insulation become faulty.

5.3. RESIDUAL RISKS FOR SURFACE PUMPS

The only residual risk is the possibility of coming into contact (even if not accidentally) with the motor cooling fan by inserting thin objects (i.e. screwdrivers, small sticks, etc.) through the holes of the fan cover.

6. TECHNICAL-PRODUCTION CHARACTERISTICS

The motor-driven pump you have purchased has been designed and manufactured in compliance with the following directives:

- MECHANICAL RISKS (Enclosure I Machines Directive):
  - EN 292-1 and EN 292-2
- ELECTRICAL RISKS (Enclosure I Machines Directive):
  - EN 292-1 and EN 292-2
  - CEI EN 60204-1
- VARIOUS RISKS (Enclosure I Machines Directive):
  - 2006/42/CE – Enclosure I

The electrical components and relative circuits installed on the motor-driven pumps are in accordance with the CEI EN 60204-1 Directive.

7. INSTALLATION, DISMANTLING AND TRANSPORT

WARNING!

INSTALLATION MUST BE CARRIED OUT BY A QUALIFIED ENGINEER.

7.1. GENERAL INSTALLATION PRECAUTIONS

a) Use metal or rigid plastic pipes in order to avoid their yielding because of the depression created at suction;
b) support and align pipes so that they do not put any stress on the pump;
c) avoid throttlings caused by bending suction and delivery hoses;
d) seal any piping connections: air infiltration in the suction pipe negatively affects pump operation;
e) we recommend that a non-return valve and a gate are installed on the delivery pipe at the motor-driven pump outlet;
f) fix the piping to the reservoir or to any fixed parts so that it is not supported by the pump;
g) do not use a lot of bends (goosenecks) and valves;
h) on SURFACE PUMPS installed above head, the suction pipe should be fitted with a foot valve and filter in order to prevent foreign matter from entering and its end should be immersed at a depth that is at least twice the diameter of the pipe; its distance from the bottom of the reservoir should also be one and a half times its diameter.
For suctions longer than 4 metres use an oversized pipe (1/4" wider at suction for improved efficiency).

7.2. INSTALLATION

a) Position the pump on a flat surface that is as close as possible to the water source. Leave enough space around the pump to allow safe use and maintenance. A free space of at least 100 mm must be kept in front of the cooling fan of surface pumps in all cases;
b) lower submersible pumps using a rope fixed to the handle and hooks provided;
c) use pipes of suitable diameters (see PART 2) fitted with threaded sleeves that must be screwed onto the pump suction and delivery unions or its threaded counterflanges;
d) SURFACE PUMPS cannot be moved or used in the open except as stated in PART 2;
e) for specific instructions, consult the chapter "PREPARING FOR USE" in PART 2.

7.3. DISMANTLING

The following must be done when moving or dismantling the motor pump:
a) disconnect the electric supply;
b) remove the delivery and suction pipes (where present) if too long or bulky;
c) if present, unscrew the screws that secure the motor-driven pump to its supporting surface;
d) if present, hold the power cable;
e) lift the motor-driven pump using equipment suitable to the pump weight and dimensions (refer to the plate).

7.4. TRANSPORTATION

The motor-driven pump is packed in a carton or can be fixed to a wooden pallet, if pump weight and dimensions allow it. Transportation should not, in any case, present any particular problems.
Verify the total weight stamped on the box.

8. ELECTRICAL CONNECTION

- **ELECTRICAL CONNECTION MUST BE CARRIED OUT BY A QUALIFIED ENGINEER.**
- **IT IS ADVISABLE TO INSTALL A HIGH INTENSITY DIFFERENTIAL SWITCH (0.03 A) ON BOTH THE THREEPHASE AND SINGLE PHASE VERSIONS.**

WARNING!

We recommend that power is supplied to the motor-driven pump using an electric panel equipped with switch, fuses and a thermal switch calibrated to the current absorbed by the motor-driven pump.

The mains must be reliably earthed, according to the electrical regulations in force in the user's country: this is the installer's responsibility.

If the motor-driven pump is supplied without a power cable, use a cable that complies with the regulations in force and the necessary section according to length, power and mains voltage.

If present, the plug of the single phase version must be connected to the mains far from sprays, water jets or rain and it must be accessible.

The three phase version does not have an internal motor protector, therefore overload protection must be provided by the user.

MOTOR-DRIVEN SURFACE PUMPS

WHILE CONNECTING, MAKE SURE THAT BOTH THE TERMINAL BOARD AND THE MOTOR DO NOT GET WET.

- Connection of the single phase versions must be made on the basis of whether thermoamperometric protection "P" is internal (FIG. 1) or external (FIG. 2).
- For threephase versions, after connecting the star (FIG. 3) or triangle (FIG. 4) cable to the terminal board, looking at the pump from the motor side, check that the cooling fan turns in *the same way as the arrow* on the label applied on the fan cover. If it is incorrect, swap two of the three wires over on the motor's terminal strip.

SUBMERSIBLE MOTOR-DRIVEN PUMPS

- In single phase versions, plug the unit into the socket.
- For threephase versions (FIG. 5), check that the motor turns in a clockwise direction looking at the pump from the top, proceed as follows: with the motor-driven pump not yet secured to the system, connect the power cable to the terminal board and switch on briefly; the pump shall start with a kick in an anti-clockwise direction, seen from the top of the pump. If the direction is wrong (clockwise), invert two of the three wires in the terminal board of the electrical panel.

FIG. 7 shows the standard voltages shown on the plate with their respective tolerances.

8.1. ADJUSTMENTS AND RECORDINGS

In pumps fitted with a float, adjust the length of the float cable with regards to the minimum and maximum value of the water (see PART 2).
Check that the system automatisms do not require a number of start-ups higher than the number shown in FIG. 8 for surface pumps and in PART 2 for submersible pumps.

9. USE AND STARTING

NEVER ALLOW THE MOTOR-DRIVEN PUMP TO OPERATE WITHOUT WATER. DOING SO CAN SERIOUSLY DAMAGE THE INTERNAL COMPONENTS.

9.1. GENERAL WARNINGS

a) Our surface pumps are designed to operate at a temperature no higher than 40 °C and a level no higher than 1000 metres;
b) our motor-driven pumps cannot be used in swimming pools or similar plants;
c) prolonged motor pump operation with the delivery pipe closed can cause damage;
d) avoid switching the motor pump on and off too frequently (check the maximum number in FIG. 8);
e) during power cuts, it is advisable to disconnect the power to the pump.

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9.2. STARTING

a) Start the pump two or three times to check system conditions;
b) restrict the delivery to cause a rapid pressure increase for a few times;
c) make sure that the noise, vibration, pressure and electrical voltage levels are normal.

9.3. STOPPING

a) Gradually interrupt water circulation in the delivery section to avoid overpressure in the piping and pump caused by water hammering;
b) switch off the main switch.

10. MAINTENANCE AND REPAIRS

We recommend periodically checking that the pump is working correctly; pay particular attention to any abnormal noise or vibration and, for surface pumps, any mechanical seal leaks.

The main and most common special maintenance operations are generally as follows:

- replacement of mechanical seals
- replacement of grommets
- replacement of bearings
- replacement of capacitors.

When the SURFACE pump remains inactive for a long period, it should be emptied completely, removing the discharge and filling caps, washed carefully with clean water then emptied. Do not leave water deposits inside.
This operation must always be carried out whenever there is a chance of frost in order to avoid the breakdown of the pump components.

10.1. TROUBLESHOOTING

DISPLAYED FAULT	CAUSE	SOLUTION
THE PUMP DOES NOT WORK **The motor does not turn**	No electricity	Check the electrical supply meter
	Plug not inserted	Check the connection to the power supply
	Incorrect electrical connection	Check the terminal board and the electrical panel
	Automatic switch triggered or fuses blown	Reset the switch or replace the fuses and verify the cause
	Float sticking	Check that the float reaches the level ON
	Thermal protection activated (single phase)	It reactivates automatically (single phase only)
THE PUMP DOES NOT WORK **The motor turns**	Decrease in the line voltage	Wait for voltage to return to normal
	Suction filter / hole blocked	Clean the filter / hole
	Foot valve blocked	Clean the valve and check its operation
	Pump not primed	Prime the pump Check any delivery non-return valves Check the liquid level
	Pressure too low	Restrict the delivery gate
THE PUMP WORKS **with a reduced flow rate**	System undersized	Re-examine the system
	System dirty	Clean the piping, valves, filters
	Water level too low	Switch off the pump or immerse the foot valve
	Incorrect rotational direction (threephase only)	Invert the two phases
	Incorrect supply voltage	Supply the pump with the voltage indicated on the ate
	Leaks from piping	Check the joints
	Pressure too high	Recheck the system
THE PUMP STOPS AFTER WORKING FOR BRIEF PERIODS **Thermal protection intervention**	Liquid temperature too high	The temperature exceeds the technical limits of the pump
	Internal fault	Contact the nearest retailer
THE PUMP STOPS AFTER WORKING FOR BRIEF PERIODS **Pressure applications**	The difference between maximum and minimum pressure is minimal	Increase the difference between the two pressures
THE PUMP DOES NOT STOP **Pressure applications**	Maximum pressure too high	Set maximum pressure at a lower value
THE PUMP VIBRATES **Or is too noisy during operation**	Flow rate too high	Reduce the flow rate
	Cavitation	Contact the nearest retailer
	Irregular piping	Fix in a better way
	Noisy bearing	Contact the nearest retailer
	Foreign bodies sliding along the motor fan	Remove the foreign bodies
	Incorrect priming	Bleed the pump and/or fill it again

11. DISPOSAL

When disposing of the pump, please comply rigorously with the regulations in force in your country, making sure that residues of the treated liquid are not left inside the pump.

Most of our pumps do not contain hazardous polluting material. Specific cases are, however, indicated in the "DISPOSAL" chapter in PART 2.

12. SUPPLIED TECHNICAL DOCUMENTATION

12.1. DRAWING SHOWING THE ELECTRICAL CONNECTIONS OF A SINGLE PHASE MOTOR-DRIVEN PUMP

See FIG. 1-2

12.2. DRAWINGS SHOWING THE ELECTRICAL CONNECTIONS OF A THREEPHASE PUMP

See FIG. 3-4-5

12.3. EXAMPLE OF A PLATE

See FIG. 6.1-6.2 (The manufacturer reserves the right to modify it).

FIG. 1

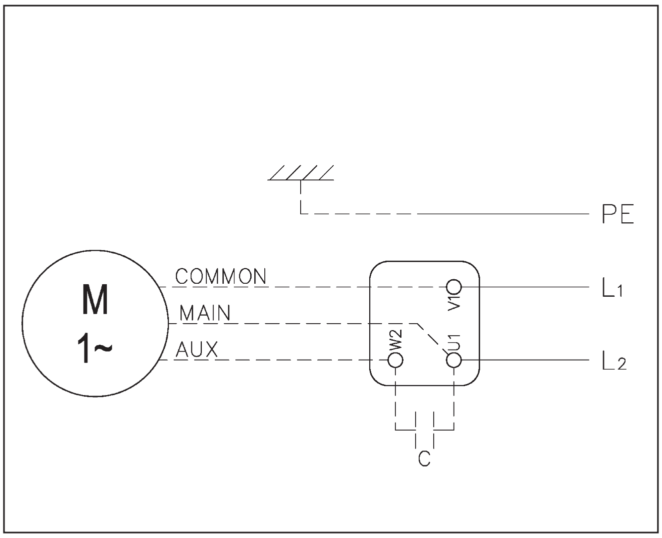


FIG. 2

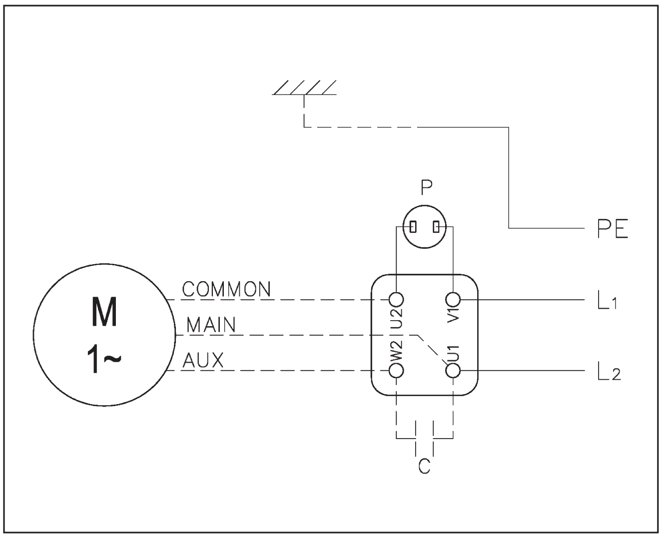


FIG. 3

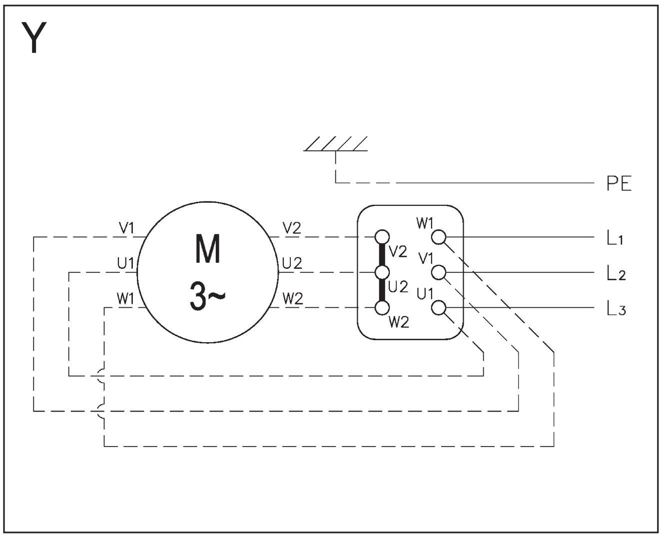


FIG. 4

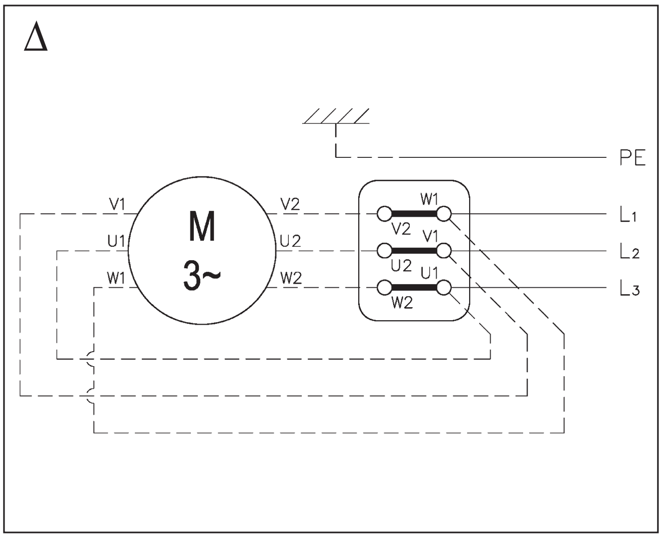


FIG. 5

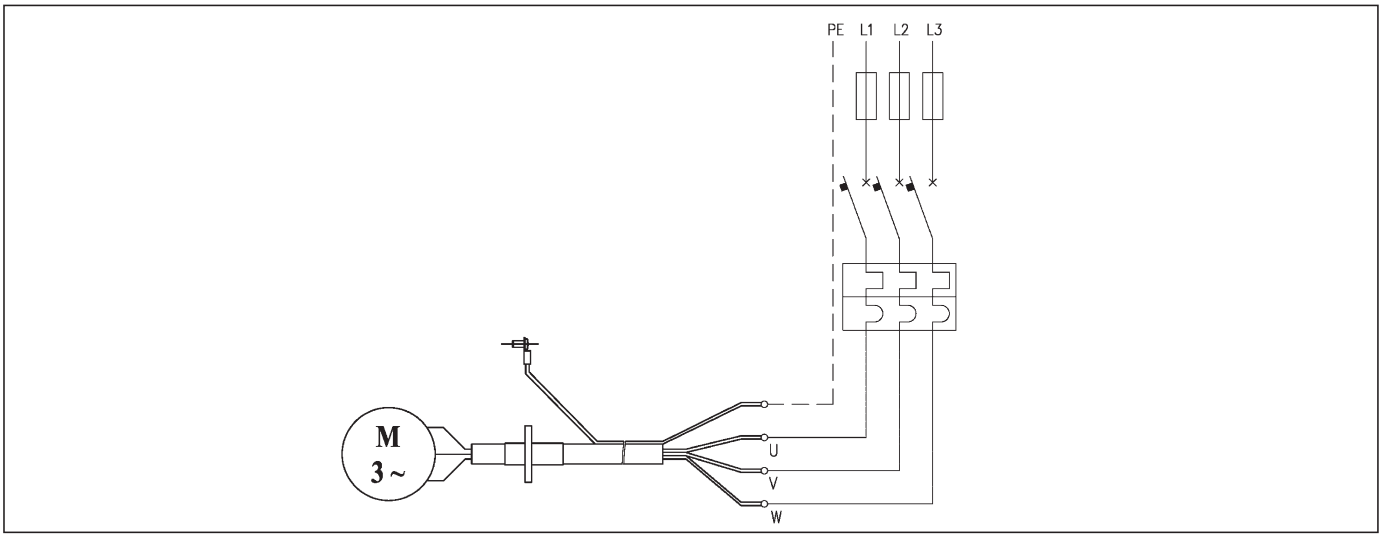


FIG. 6.1

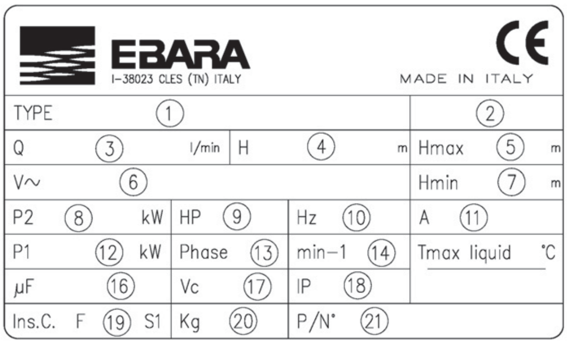
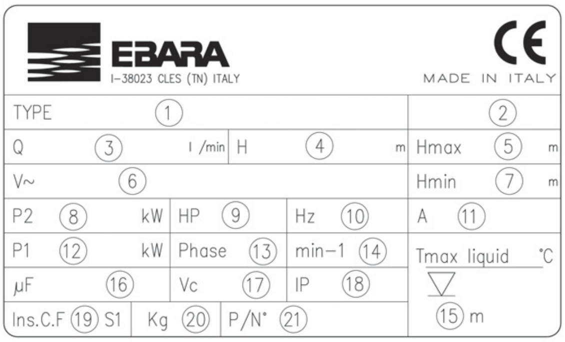


FIG. 6.2



1)	**“TYPE”**	Modello pompa • Pump model • Modèle pompe • Pumpenmodell • Modelo bomba • Pumpens modell • Pumpemodel • Pumpun malli • Model pomp • Modelo bomba • Μοντέλο αντλίας • Model čerpadla • Model čerpadla • Model pompy • Модель насоса • Pompa modeli • نموذج / صنف المضخة
2)	**“DATA CODE”**	Numero di serie • Serial number • Numéro de série • Seriennummer • Número de serie • Serienummer • Serienummer • Sarjanumero • Serienummer • Numero de série • Αριθμός σειράς•Výrobní číslo • Číslo série • Numer fabryczny • Серийный номер • Seri numarası • رقم تسلسل المضخة
3)	**“Q”**	Indicazione dei punti di portata minima e massima • Maximum and minimum flow rate points • Indication des débits MINI et MAXI. • Angabe des min. und des max. Durchsatzes • Indicación de los puntos de caudal mínimo y máximo • Indikation om punkter för min. och max. kapacitet • Indikation om minimums- og maksimumskapacitetspunkterne • Minimi- ja maksimivirtausnopeuspisteet • Indicatie minimum- en maximumdebiet • Indicações dos pontos de capacidade mínima e máxima • Ένδειξη ελάχιστων και μέγιστων τιμών παροχής • Údaje o minimálním a maximálním dopravovaném množství • Údaje o minimálnom a maximálnom dopravovanom množstve • Wskazanie punktów minimalnej i minimalnej nośności • Указание точек минимальной и максимальной производительности • Minimum ve maksimum kapasite noktaları işareti • تدل على اقل و اكثر كمية تعطيه المضخة
4)	**“H”**	Indicazione dei punti di prevalenza corrispondenti alla minima e massima portata • Head points corresponding to maximum and minimum flow rate • Indication des H.M.T. correspondant aux débits MINI et MAXI. • Angabe der Förderhöhe, die dem min. und dem max. Durchsatz entsprechen • Indicación de los puntos de presión correspondientes a los caudales mínimo y máximo • Indikation om uppfordringshöjdspunkter som motsvarar min. och max. kapacitet • Indikation om prævalenspunkterne, svarende til minimums- og maksimumskapaciteten • Minimi- ja maksimivirtausnopeutta vastaavat painekorkeuspisteet • Indicatie van de opvoerhoogte overeenkomstig het minimum- en maximumdebiet • Indicações dos pontos de prevalência correspondentes á mínima e á máxima capacidade • Ένδειξη τιμών ανύψωσης που αντιστοιχούν στη μέγιστη και ελάχιστη παροχή • 1.Údaje o dopravní výšce (výtlaku) odpovídající minimálnímu a maximálnímu dopravovanému množství • Údaje o dopravnej výške (výtlaku) odpovedajúcej minimálnemu a maximálnemu dopravovanému množstvu • Wskazanie punktów wysokiego ciśnienia odpowiadających minimalnego i maksymalnej nośności • Указание точек напора, соответствующих минимальной и максимальной производительности • Minimum ve maksimum kapasite için basınç yüksekliği noktaları işareti • تدل على اقل و اكثر ارتفاع تعطيه المضخة بالنسبة الى الكمية
5)	**“Hmax”**	Prevalenza massima • Maximum head • Hauteur MAXI • Max. Förderhöhe • Presión máxima • Max. uppfordringshöjd • Maksimum prævalens • Maksimipainekorkeus • Max. opvoerhoogte • Prevalência máxima • Μέγιστη ανύψωση • Maximální dopravní výška • Maximálna dopravná výška • Ciśnienie maksymalne • Максимальный напор • Maksimum Basınç Yüksekliği • اكثر ارتفاع تعطيه المضخة
6)	**“V~”**	Tensione/i nominale/i • Rated voltage/s • Tension/s nominale/s • Nennspannung/en • Tensión/es nominal/es • Märkspänning • Nominalspænding • Nimellisjännite/-jännitteet • Nominale spanning(en) • Tensões / os nominais/ i • Ονομαστική (ές) Τάση (εις) • Jmenovité napětí • Menovité napätie • Napięcie/a nominalne • Номинальное напряжение (напряжения) • Nominal gerilim/ler • الجهد المتوسط المعيَّن(VOLT)
7)	**“Hmin”**	Prevalenza minima • Minimum head • Hauteur MINI • Min. Förderhöhe • Altura de elevación mínima • Min. uppfordringshöjd • Minimum prævalens • Minimipainekorkeus • Minimale opvoerhoogte • Prevalência mínima • Ελάχιστη ανύψωση • Minimální dopravní výška • Minimálna dopravná výška • Ciśnienie minimalne • Минимальный напор • Minimum Basınç Yüksekliği • اقل ارتفاع تعطيه المضخة
8)	**“P2”**	Potenza nominale del motore (potenza resa all’asse) • Rated motor power (power delivered at axis) • Puissance nominale du moteur (puissance rendue à l’axe) • Nennleistung des Motors (Leistungsabgabe an der Achse) • Potencia nominal del motor (potencia en el eje) • Motorns märkeffekt (axeleffekt) • Motorens nominaleffekt (nytteeffekt på akslen) • Moottorin nimellisteho (akselin antoteho) • Nominaal vermogen van de motor (vermogen overgebracht op as) • Potência nominal do motor [potência resistência eixo] • Ισχύς του κινητήρα (ισχύς στον άξονα) • Jmenovitý výkon motoru (výkon v ose) • Menovitý výkon motora (meraný na osi) • Nominalna moc silnika (moc na osi) • Номинальная мощность двигателя (отдаваемая мощность на оси) • Motorun nominal gücü (eksene verilen güç) • قدرة المحرك المعيَّن بالكيلو واط (القدرة الناتجة في المحور)
9)	**“HP”**	Potenza nominale del motore espressa in HP (horse power) • Rated motor power expressed in HP (horse power) • Puissance nominale du moteur exprimée en HP (horse power) • Nennleistung des Motors, ausgedrückt in HP • Potencia nominal del motor en HP (horse power) • Motorns märkeffekt i hästkrafter• Motorens nominaleffekt udtrykt i HP (hestekræfter) • Moottorin nimellisteho hevosvoimina • Nominaal vermogen van de motor uitgedrukt in HP (“horse power”: paardekracht) • Potência nominal do motor expressa em HP [horse power] • Ονομαστική ισχύς του κινητήρα εκφραζόμενη σε HP (δύναμη ίππου) • Jmenovitý výkon motoru vyjádřený v HP (koňská síla) • Menovitý výkon motora meraný v HP (horse power=konská sila) • Nominalna moc silnika wyrażona w koniach mechanicznych • Номинальная мощность двигателя, выраженная в Л.С. (лошадиных силах) • HP (beygir gücü) olarak belirtilmiş motorun nominal gücü • قدرة المحرك بالحصان

10)	**“Hz”**	Frequenza • Frequency • Fréquence • Frequenz • Frecuencia • Frekvens • Frekvens • Taajuus • Frequentie • Frequência • Συχνότητα • Kmitočet • Frekvencia • Częstotliwość • Частота • Frekans • التردد
11)	**“A”**	Corrente nominale • Rated current • Courant nominal • Nennstrom • Corriente nominal • Märkström • Nominalstrøm • Nimellisvirta • Nominale stroom • Corrente nominal • Ονομαστικό ρεύμα • Jmenovitý elektrický proud • Menovitý prúd • Prąd nominalny • Номинальный ток • Nominal akım • التيار المعيَّن
12)	**“P1”**	Potenza assorbita dalla linea elettrica • Power absorbed by the electrical line • Puissance absorbée par la ligne électrique • Leistungsaufnahme der elektrischen Leitung • Potencia absorbida por la línea eléctrica • Effektförbrukning • El-linjens absorberede effekt • Ottoteho sähköverkosta • Geabsorbeerd vermogen door het elektriciteitsnet • Potência absorvida da linha elétrica • Ισχύς που απορροφάται από την ηλεκτρική γραμμή • Příkon • Moc pochłonięta przez linię elektryczną • Мощность, потребляемая от электросети • Elektrik hattı tarafından emilen güç • القدرة المسحوبة من الكهرباء
13)	**“Phase”**	Tipo di motore (monofase o trifase) • Motor type (single phase or threephase) • Type de moteur (monophasé ou triphasé) • Motortyp (Einphasig oder Drehstrom) • Tipo de motor (monofásico o trifásico) • Motortyp (enfas eller trefas) • Motortype (monofase eller trefase) • Moottorin tyyppi (yksi- tai kolmivaihe) • Motortype (éénfasig of driefasig) • Tipo de motor [monofásica ou trifásica] • Είδος κινητήρα (μονοφασικός ή τριφασικός) • Typ motoru (jednofázový nebo třífázový) • Druh motora (jednofázový alebo trojfázový) • Rodzaj silnika (jednofazowa lub trójfazowa) • Тип двигателя (однофазный или трехфазный) • Motor tipi (mono faz veya trifaz) • نوع المحرّك (أحادي أو ثلاثي الطور)
14)	**“min^{-1}”**	Velocità di rotazione • Rotational speed • Vitesse de rotation • Rotationsgeschwindigkeit • Velocidad de rotación • Rotationshastighet • Rotationshastighed • Pyörimisnopeus • Rotatiesnelheid • Velocidade de rotação • Ταχύτητα περιστροφής • Rychlost otáčení • Rýchlosť otáčok • Prędkość obrotowa • Скорость вращения • Rotasyon hızı • سرعة الدوران
15)	**∇/m**	Massima profondità di funzionamento • Maximum operating depth • Profondeur maximale de fonctionnement • Max. Einsatztiefe • Máxima profundidad de funcionamiento • Maximalt driftdjup • Maksimal driftsdybde • Maksimikäyttösyvyys • Maximumdiepte voor functionering • Máxima profundidade de funcionamento • Μέγιστο βάθος λειτουργίας • Maximální provozní hloubka • Maximálna prevádzková hĺbka • Maksymalna głębokość działania • Максимальная глубина работы • Maksimum çalışma derinliği • العمق الأقصى أو الأكثر للتشغيل
16)	**“μF”**	Capacità del condensatore (solo per monofase) • Capacitor capacity (single phase only) • Capacité du condensateur (seulement pour monophasé) • Kapazität des Kondensators (nur für einphasige Version) • Capacidad del condensador (sólo monofásico) • Kondensatorns kapacitet (endast enfas) • Kondensatorkapacitet (angår kun monofase) • Kondensaattorin kapasitanssin (vain yksivaihe) • Condensorvermogen (alleen éénfasig) • Capacidade do condensador [somente para monofásica] • Χωρητικότητα του πυκνωτή (μόνο για μονοφασικό μοντέλο) • Kapacita kondenzátoru (pouze u jednofázového čerpadla) • Kapacita kondenzátora (len pre jednofázu) • Pojemność kondensatora (jedynie dla jednofazowej) • Емкость конденсатора (только для однофазного) • Kondansatör kapasitesi (sadece mono faz) • سعة المكثف (فقط أحادي الطور)
17)	**“Vc”**	Tensione del condensatore (solo per monofase) • Capacitor voltage (single phase only) • Tension du condensateur (seulement pour monophasé) • Spannung des Kondensators (nur für einphasige Version) • Tensión del condensador (sólo monofásico) • Kondensatorns spänning (endast enfas) • Kondensatorspænding (angår kun monofase) • Kondensaattorin jännite (vain yksivaihe) • Condensorspanning (alleen éénfasig) • Tensão do condensador [somente para monofásica] • Τάση του πυκνωτή (μόνο για μονοφασικό μοντέλο) • Napětí kondenzátoru (pouze u jednofázového čerpadla) • Napätie kondenzátora (len pre jednofázu) • Napięcie kondensatora (jedynie dla jednofazowej) • Напряжение конденсатора (только для однофазного) • Kondansatör gerilimi (sadece mono faz) • جهد المكثف(فقط أحادي الطور)
18)	**“IP”**	Grado di protezione della pompa • Pump protection rating • Degré de protection de la pompe • Schutzgrad der Pumpe • Grado de protección de la bomba • Elpumpens kapslingsklass • Pumpens beskyttelsesgrad • Pumpun suoja-aste • Beschermingsgraad van de pomp • Grau de proteção da bomba • Βαθμός προστασίας της αντλίας • Stupeň ochrany čerpadla • Stupeň ochrany čerpadla • Stopień zabezpieczenia • Класс защиты насоса • Pompa koruma derecesi • مستوى حماية المضخة
19)	**“Ins. C. F S1”**	Classe di isolamento motore e tipo di servizio • Motor insulation class and type of service • Classe d’isolation du moteur et type de service • Isolierungsklasse des Motors und Betriebsart • Clase de aislamiento motor y tipo de servicio • Motorns isolation och användningstyp • Motorens isolationsklasse og servicetype • Moottorin eristysluokka ja käyttötyyppi • Klasse motorisolatie en type werking • Classe de isolamento motor e tipo de serviço • Τάξη μόνωσης του κινητήρα και είδος λειτουργίας • Stupeň izolace motoru a typ použití• Trieda izolácie motora a typ použitia• Klasa izolacji silnika i rodzaju obsługi • Класс изоляции двигателя и тип работы • Motor izolasyon sınıfı ve hizmet tipi • درجة عزل المحرك و نوع العمل
20)	**“ kg”**	Peso • Weight • Poids • Gewicht • Peso • Vikt • Vægt • Paino • Gewicht • Peso • Βάρος • Hmotnosť • Hmotnosť • Ciężar • Масса • Ağırlık • الوزن
21)	**P/N°**	Codice articolo pompa • Pump item code • Code article pompe • Artikelnummer der Pumpe • Código artículo bomba • Elpumpens art. nr • Pumpeartikelkode • Pumpun tuotekoodi • Artikelcode pomp • Código artigo bomba • Κωδικός της αντλίας • Kód výrobku čerpadla • Kód typu čerpadla • Kod artykułu pompy • Артикул насоса • Pompa ürün kodu • رقم المضخة

FIG. 7

SINGLE PHASE		
Voltage indicated in the label	**Tolerance**	**Operative**
110 [V]	± 6%	103 - 117 [V]
115 [V]	± 6%	108 - 122 [V]
220 [V]	± 6%	207 - 233 [V]
230 [V]	± 10%	207 - 253 [V]
240 [V]	± 6%	226 - 255 [V]
208-230 [V]	± 6%	196 - 244 [V]
220-230 [V]	± 6%	207 - 244 [V]
230-240 [V]	-10% +6%	207 - 255 [V]
Other [V]	± 5%	–

THREE PHASE			
		Operative Range	
Voltage indicated in the label	***Tolerance***	***Delta connection "Δ"***	***Star connection "Y"***
220 Δ/ 380 Y [V]	± 6%	207 - 233 Δ	357 - 403 Y [V]
240 Δ/ 415 Y [V]	± 6%	226 - 253 Δ	390 - 440 Y [V]
230 Δ/ 400 Y [V]	± 10%	207 - 253 Δ	360 - 440 Y [V]
220-240 Δ/ 380-415 Y [V]	± 6%	207 - 253 Δ	360 - 440 Y [V]
230-240 Δ/ 400-415 Y [V]	-10% +6%	207 - 253 Δ	360 - 440 Y [V]
230 [V]	± 10%	207 - 253 Δ	not available
400 [V]	± 10%	not available	360 - 440 Y [V]
208 - 230 [V]	± 5%	198 - 242 Δ	not available
460 [V]	-10% +6%	not available	414 - 488 Y [V]
Other [V]	± 5%	–	–

FIG. 8

MAXIMUM NR OF STARTS PER HOUR		
Nominal motor power (P2) [kW]	**Closed couple pumps [N.°]**	**EVM, 3S, 3P [N.°]**
≤ 1.85	40	35
2.2 ÷ 4	30	30
5.5 – 7.5	20	20
9.2 ÷ 13	15	15
15 – 18.5	12	15
22 – 30	12	12
37 – 45	/	8
55	/	4

PRODUCTS:
JES-JE- JESX-JEX- AGE-AGF-AGA-AGC; CD-2CD; CDX-2CDX-DWO-DWC-CMA-CMB-CMC-CMD-CMR-CDA; PRA; LPS; COMPACT-CVM-MATRIX-MULTIGO-MULTIGO INLINE; EVM; 3SERIES-MD; OPTIMA-BEST-RIGHT-DW; WINNER-BHS-IDROGO; SF6.

DICHIARAZIONE DI CONFORMITÀ
Noi, EBARA PUMPS EUROPE S.p.A., dichiariamo sotto la nostra responsabilità che i ns. prodotti sono in conformità alla Direttiva Macchine 2006/42/CE, alla Direttiva Bassa Tensione 73/23/CEE come modificato dalla direttiva 93/68/CEE e alla Direttiva Compatibilità Elettromagnetica 89/336/CEE come modificato dalla direttiva 93/68 CEE.

DECLARATION OF CONFORMITY
We, EBARA PUMPS EUROPE S.p.A., declare under our own responsibility that our products conform to the Machinery Directive 2006/42/EC, to the Low Voltage Directive 73/23/EEC, as amended by Directive 93/68/EEC and to the Electromagnetic Compatibility Directive 89/336/EEC as amended by Directive 93/68/EEC.

DECLARATION DE CONFORMITE
Nous soussignons, EBARA PUMPS EUROPE S.p.A., déclarons sous notre responsabilité que nos produits sont conformes à la Directive sur les Machines 2006/42/CE, à la Directive sur la Tension Basse 73/23/CEE, comme modifiée par la Directive 93/68/CEE et à la Directive sur la Compatibilité Electromagnétique 89/336/CEE comme modifiée par la Directive 93/68/CEE.

KONFORMITAETSERKLARUNG
Wir, EBARA PUMPS EUROPE S.p.A., erklären unter unserer Verantwortung, dass unsere Erzeugnisse mit der Maschinenvorschift 2006/42/CE, sowie sie auch mit der Richtlinie über Tiefspannung 73/23/CEE wie von der Richtlinie 93/68/CEE abgeändert und mit der Vorschrift über elektromagnetische Verträglichkeit 89/336/CEE wie von der Norm 93/68/CEE abgeändert übereinstimmen.

DECLARACIÓN DE CONFORMIDAD
Nosotros, EBARA PUMPS EUROPE S.p.A., declaramos bajo nuestra responsabilidad que nuestros productos son conformes con la Directiva Máquinas 2006/42/CE; con la Directiva Baja Tensión 73/23/CEE y su modificación Directiva 93/68/CEE; y con la Directiva Compatibilidad Electromagnética 89/336/CEE y su modificación Directiva 93/68/CEE.

DECLARATION OEM ÖVERENSSTÄMMANDE
Vi, EBARA PUMPS EUROPE S.p.A., deklarerar i enlighet med vårt ansvar, att våra produkter är överensstämmande med Maskindirektiv 2006/42/CE, med Lågspännings Direktiv 73/23/CEE som modifierats från direktiv 93/68/CEE och med Direktivet för Elektromagnetisk Kompatibilitet 89/336/CEE som modifierats från direktiv 93/68/CEE.

DEKLARACJA ZGODNOŚCI Z NORMAMI
My, EBARA PUMPS EUROPE S.p.A., oświadczamy na naszą odpowiedzialność, że nasze produkty, są zgodnie z Normami Maszynowymi 2006/42/CE, oraz Dyrektywą Niskonapięciową 73/23/CEE z modyfikacją Dyrektywą nr 93/68/CEE oraz Normą Elektromagnetyczną EMC 89/336/CEE z modyfikacją Dyrektywą nr 93/68 CEE.

ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ
Мы, EBARA PUMPS EUROPE S.p.A., заявляем под личной ответственностью, что что наши изделия изготовлены в соответствии с Директивой по машинам 2006/42/CE, Директивой по Низкому Напряжению 73/23/CEE модифицированное директивой 93/68/CEE и Директивой по Электромагнитной Совместимости 89/336/CEE модифицированное директивой 93/68 CEE.

شهادة التطابق

تتعهد شركة إيبارا (EBARA PUMPS EUROPE S.p.A.) ان منتجاتها تطابق قوانين الاتحاد الاوروبي: للتوجيهات الميكانيكية رقم (2006/42/CE)، و توجيهات الجهد المنخفض رقم CEE /73/23 الذي تم تعديله الى رقمCEE/ 93/68 ، و انطباق الكهرباء المغناطيسية رقمCEE / 89/336 الذي تم تعديله الى رقم 93/68/CEE .

ERKLÆRING OEM OVERENSSTEMMELSE
Vi, EBARA PUMPS EUROPE S.p.A., erklarer herved ifølge vort ansvar, at vore produkter er i overensstemmelse med Maskindirektiv 2006/42/CE, med Lavspændingsdirektiv 73/23/CEE som modificerets fra direktiv 93/68/CEE og med Direktivet for Elektromagnetisk Kompatibilitat 89/336/CEE som modificerets fra direktiv 93/68/CEE.

YHTÄPITÄVYYSLAUSUNTO
Me, EBARA PUMPS EUROPE S.p.A., ilmoitamme vastuunalaisena, että tuotteemme ovat yhdenmukaisia Kone Ohjeiden 2006/42/CE, Matalajännite Ohjeiden 73/23/CEE muutettu säännöksillä 93/68/CEE ja Sähkömagneettisuus Yhteensopivuus Ohjeiden 89/336/CEE muutettu säännöksillä 93/68/CEE.

OVEREENKMSTIGHEIDSVERKLARING
Wij, EBARA PUMPS EUROPE S.p.A., verklaren onder eigen verantwoordelijkheid dat onze produkten in overeenstemming zijn met de Richtlijn Betreffende de Machines 2006/42/CE, met de Richtlijn Lage Spanning 73/23/CEE, zoals die gewijzijd is door de richtlijn 93/68/CEE en met de Richtlijn Elektromagnetsche conformiteit 89/336/CEE zoals die gewijzijd is door de richtlijn 93/68/CEE.

DECLARAÇAO DE CONFORMIDADE
Nós, EBARA PUMPS EUROPE S.p.A., declaramos sobra nossa responsabilidade que, os produtos são em conformidades à Diretriz Macchine 2006/42/CE, à Diretriz Baixa Tensão 73/23/CEE, sendo modificado da Diretriz 93/68/CEE e a Diretriz de Compatibilidade Electromagnética 89/336/CEE sendo modificada da Diretriz 93/68/CEE.

ΔΗΛΩΣΗ ΣΥΜΦΩΝΙΑΣ
Εμείς η EBARA PUMPS EUROPE S.p.A, δηλώνουμε με δική μας ευθύνη ότι τα προιόντα μας εκπληρούν τις προϋποθέσεις της Οδηγίας Μηχανών 2006/42/ΕΕ Ευρωπαική Ένωσης, της Οδηγίας Χαμηλής Έντασης 73/23 ΕΕ όπως τροποποιήθηκε από την οδηγία 93/68 ΕΕ και της Οδηγίας Ηλεκτρομαγνητικής Συμβατότητας 89/336 ΕΕ όπως τροποποιήθηκε από την οδηγία 93/68 ΕΕ.

PROHLÁŠENÍ O SHODĚ
My, EBARA PUMPS EUROPE S.p.A., prohlašujeme na naši odpovědnost, že naše výrobky jsou vyrobeny v souladu se Směrnicí Stroje 2006/42/CEE, se Směrnicí Nízké napětí 73/ 23/ CEE podle změny směrnicí 93/ 68/ CEE a Směrnicí Elektromagnetická kompatibilita 89/ 336/ CEE podle změny směrnicí 93/ 68/ CEE.

ČESTNÉ PREHLÁSENIE
My, EBARA PUMPS EUROPE S.p.A., prehlasujeme na vlastnú zodpovednosť, že naše výrobky sú v súlade s normamy o Zariadeniach 2006/42/CE, s normamy Nízkeho Napätia 73/23/CEE, ako bolo zmenené z normy 93/68/CEE, a s normou Elektromagnetický Súlad 89/336/CEE, ako bolo zmenené z normy 93/68 CEE.

UYGUNLUK DEKLERASYONU
EBARA PUMPS EUROPE S.p.A. mallarinin (uretimlerinin), 2006/42/CE Mkineler Direktifi 73/23/CEE Dusuk Voltaj Direktifi, 93/68/CEE tarafindan modifiye dilen 93/68/CEE ve 89/336/CEE Elektromanyetik Bagdasma Direktifi tarafindan modifiye edilmis Ve kendisinin sorumlulugu altinda oldugunu deklare eder.

Mr. SASAKI KENICHI
President

Brendola, 19 July 2006

EBARA

GB

OPERATING AND MAINTENANCE MANUAL PART 2
THE USER SHOULD KEEP THIS DOCUMENT

1. INTRODUCTION

This instruction manual is split into two booklets: PART 1, containing general information regarding our whole product range; and PART 2, containing information specific to the motor-driven pump you have purchased. The two publications are complementary to each other, so make sure you have both.
Comply with the instructions contained in them to get the most out of your motor-driven pump and assure its proper operation.
If you need further information, get in touch with your nearest authorized dealer.
If information in the two parts contradict each other, take PART 2 containing the product's specific information as valid.

The following symbols have been used in the compilation of this instruction booklet:

WARNING	**Risk of damaging the pump or system**
⚠	**Risk of causing injury or damaging property**
⚡	**Electrical hazard**

2. CONTENTS

3. DESCRIPTION AND USE OF MOTOR-DRIVEN PUMP

3.1. DESCRIPTION

Description		**MOTOR-DRIVEN SURFACE PUMPS**
MODEL / Type	**3M-3LM-3BM**	**Close-coupled steel pump**
	3S-3LS-3BS	**Close-coupled with standard flanged motors and rigid coupling**
	3P-3LP-3BP	**Coupled to motor with flexible coupling and supporting base**
	3PF 3LPF-3BPF	**Free-shaft (with no motor and base)**
	MD	**Close-coupled cast iron pump**

The motor-driven pumps are employed to handle cold and hot water (see chap. 4) and are used in permanent installations. They are built with materials assuring long life and consistent performance if used according to the instructions given in Part 1 and 2 of the manual.
Their special construction means they can be disassembled to service the motor and replace the impeller and mechanical seal without having to disconnect the pump casing from the suction and delivery lines. They are designed for medium and high delivery rates in conformity with EN 733 DIN 24255 standards and other corresponding European standards.

3.2. USE FOR WHICH PUMPS ARE DESIGNED

The motor-driven pumps can be used for the following applications:
RESIDENTIAL AND COMMERCIAL: water lifting, pressure boosting systems, air-conditioning, cooling.
FARMING: sprinkler or flood irrigation.
INDUSTRIAL: water handling, washing plants, transfer of moderately aggressive liquids compatible with AISI 304/316 steel for 3/3L-series models.
Use the motor-driven pump based on its technical specifications.

3.3. USE FOR WHICH PUMPS ARE NOT DESIGNED

Series-3 and MD motor-driven pumps cannot be used to handle dirty water, water containing acids and corrosive liquids in general, water with temperatures higher than those mentioned in chap. 4, saltwater, flammable liquids and hazardous liquids in general.
The motor-driven pumps must never be made to work without liquid.

4. SPECIFICATIONS

4.1. SERIES-3 PUMP SPECIFICATIONS

	U/M	3M-3LM-3BM	3S-3LS-3BS-3SF	3P-3LP-3BP 3PF-3LPF
Max. temperature of liquid pumped	°C	-10 +90 -10 +110 (3MH,3MHS,3LM)	-10 +90 -10 +110 (3S,3SHS,3LS)	-10 +90 -10 +110 (3PH,3PHS,3LP)
Suction diameter	mm	50-65-80		
Delivery diameter	mm	32-40-50-65		
Maximum working pressure	MPa	1		

4.2. MD PUMP SPECIFICATIONS

	U/M	MD
Max. temperature of liquid pumped	°C	90
Suction diameter	mm	50-65-80
Delivery diameter	mm	32-40-50-65
Maximum working pressure	MPa	1

4.3. SERIES-3, MD MOTOR SPECIFICATIONS

TYPE	TEFC
RATINGS	See motor-driven pump rating plate
OVERLOAD PROTECTION	SINGLE PHASE: thermal cutout w/ automatic reset THREE PHASE: by installer

4.4. INFORMATION ON AIRBORNE NOISE

Power kW	MOTOR		50 Hz		60 Hz	
	3_M-MD Shaft height	3S-3P Shaft height	3_M-MD LpA [dB] (A)*	3S-3P** LpA [dB] (A)*	3_M-MD LpA [dB] (A)*	3S-3P** LpA [dB] (A)*
1.1	90	80	<70	<70	72	<70
1.5	90	90	<70	<70	72	70
2.2	90	90	<70	<70	72	70
3	100	100	71	<70	76	74
4	100	112	71	73	76	78
5.5	112	132	75	77	80	82
7.5	112	132	75	77	80	82
9.2	132	132	80	77	85	82
11	132	160	80	79	85	84
13	132	-	80 (MD)	-	-	-
15	132	160	80	79	85	84
15	160	160	83-82	79	88-87	84
18.5	160	160	83-82	79	88-87	84
22	160	180	83-82	80	88-87	85

Power kW	MOTOR		4 poles 50Hz	
	3_M Shaft height	3S-3P Shaft height	3_M LpA dB(A)*	3S-3P** LpA dB(A)*
≤ 3	71-100	71-100	<70	<70

* Sound pressure level - Mean value of measurements taken 1 m from the pump. Tolerance ± 2.5 dB.
** Sound pressure level of pumps featuring AEG motor.

THE MANUFACTURER RESERVES THE RIGHT TO AMEND TECHNICAL DATA FOR THE PURPOSE OF PRODUCT IMPROVEMENTS AND UPDATING.

5. PREPARING FOR USE

WARNING **TO LIFT OR MOVE THE MOTOR-DRIVEN PUMP, USE A ROPE STRONG ENOUGH TO TAKE ITS WEIGHT, TAKING CARE NOT TO TILT THE PUMP TOO MUCH (MAX. 20°) (FIG. 1);**

5.1. INSTALLATION SERIES 3, MD

To install the pumps, proceed as directed in PART 1, chapter 7.2 and in the following points:
- use pipes of a suitable diameter, bearing in mind that suction diameter (front side of pump) is different to delivery diameter (top side of pump), (see chap. 4).

5.1.1. FOR MOTOR-DRIVEN PUMPS 3P-3LP-3BP

Units from series 3P - 3LP – 3BP are mounted on a base. Since the units to be installed are not particularly heavy, and loads through the pipes are not expected to be heavy, a base plate is not essential. However, a raised base plate would make it easier to insert a container underneath to catch liquid when the pump casing needs draining, and would double as a safety platform when the floor is in danger of being flooded. When units are placed directly on the floor, all you need to do is set just the anchor bolts in the concrete.
Although the pump and motor have been aligned at the factory, the base plate may be distorted when the locking screws are fastened during installation. To assure correct alignment, use a comparator or callipers to make sure the distance between the two halves of the coupling is the same all the way round. Using a rule or comparator, also check alignment (concentricity) of the connector strip where the two halves of the coupling meet. The coupling's cover must be removed for alignment. Make sure you have refitted it before starting the pump. Checks must be made at four diametrically opposed points. Errors must be corrected by loosening or removing the screws if necessary to move the feet on the base and possibly add calibrated metal strips (FIG. 4).

IF ALIGNMENT IS NOT ACCURATE, YOU MAY ENCOUNTER VIBRATIONS, DAMAGE TO BEARINGS AND COUPLINGS AND THE END OF THE SHAFT MAY BREAK.

5.2. PIPEWORK SERIES 3, MD

To install pipes, proceed as directed in PART 1, chapter 7 and in the following points:
a) do not fit the pump on misaligned pipes;
b) use a suitable support for the suction and delivery line so as not to compromise the motor-driven pump's alignment;
c) install a nonreturn valve between the pump and delivery gate valve in the following cases:
   - when piping is long;
   - when actual head is high;
   - when the pump is automatic;
   - when water is pumped into the tank;
   - when two or more pumps are working in parallel;
d) suction system:
   1. the suction line should slope upwards (over 1/100) with respect to the pump to stop air pockets forming. Pipe couplings must be fastened so that air is not sucked in;
   2. the suction line must be as short and straight as possible;
   3. install the suction reducer as illustrated in FIG. 2 to stop air pockets forming.

5.3. FILLING MD PUMPS

GB

WARNING **OPERATION TO BE PERFORMED WITH THE MOTOR'S TERMINAL STRIP FULLY CLOSED.**

a) Unscrew the hexagonal cap located on the front of the pump casing at the top;
b) with the aid of a funnel, fill the pump with water to overflowing;
c) screw the hexagonal cap back on until it is locked tight to prevent air getting in.

5.4. DISASSEMBLING MOTOR-DRIVEN PUMPS (FIG.3)

The support of the 3M-MD-series pump is designed to allow maintenance work when needed, so that the motor assembly can be removed without disconnecting the casing from the pipes.
To remove the 3S - 3LS – 3BS motor-driven pump's motor, proceed as follows:
- with the aid of a screwdriver, remove the two mesh guards (44) by pressing towards the middle and pull them out of the slots in the sleeve (3) (fig. 3B);
- loosen the two screws (215) securing the coupling (6) on the end of the motor shaft – remove the screws (206) connecting the motor flange to the sleeve flange. For pumps coupled to motors according to construction method IM 335 (B3/B5 i.e. with flange and feet) (fig. C and D), remove the screws for fastening to the supports.

At this point, you can remove the motor from its housing, moving it axially. Parts are refitted following the procedure in reverse order.
Apply threadlocker to grub screws (215) to prevent loosing during operation.

5.5. DISASSEMBLING MOTOR-DRIVEN PUMPS 3P-3LP 3BP (FIG. 4)

All inside parts can be disassembled and inspected without removing the pump casing and pipes. Once you have isolated the motor-driven pump from the system (close the gate valves, disconnect all connections, drain the pump casing), disassemble in the order given below:
- coupling cover
- motor, and mount where applicable
- mount support
- mounting unit complete with impeller and seal holder disc
- parts are refitted following the procedure in reverse order.

6. SCHEMI E DISEGNI • 6. DIAGRAMS AND DRAWINGS • 6. SCHÉMAS ET DESSINS • 6. PLÄNE UND ZEICHNUNGEN • 6. ESQUEMAS Y PLANOS • 6. SCHEMAN OCH RITNINGAR • 6. DIAGRAMMER OG TEGNINGER • 6. KAAVIOT JA KUVAT • 6. SCHEMA'S EN TEKENINGEN • 6. ESQUEMAS E DESENHOS • 6. ΔΙΑΓΡΑΜΜΑΤΑ ΚΑΙ ΣΧΕΔΙΑ • 6. SCHÉMATA A VÝKRESY • 6. SCHÉMY A VÝKRESY • 6. SCHEMATY I RYSUNKI • 6. СХЕМЫ И ЧЕРТЕЖИ • 6. ŞEMALAR VE RESİMLER • 6. مخططات و رسوم

FIG. 1

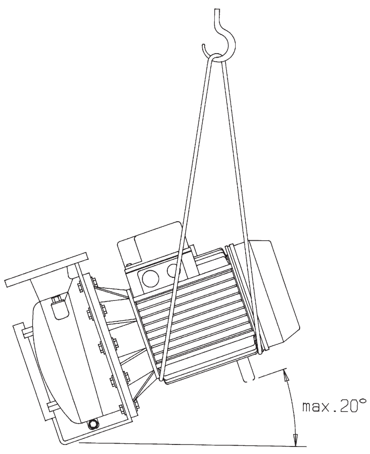


FIG. 2

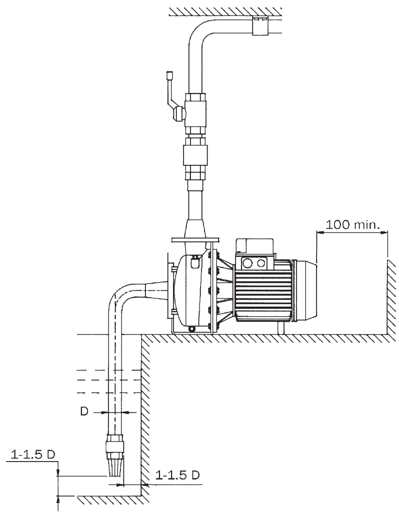


FIG. 3A

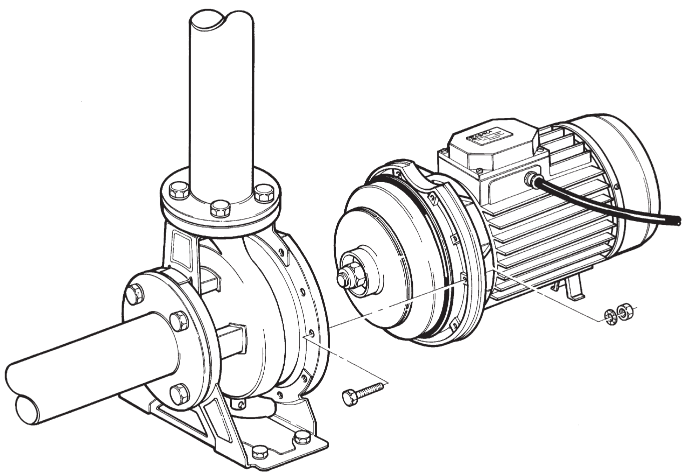


FIG. 3B

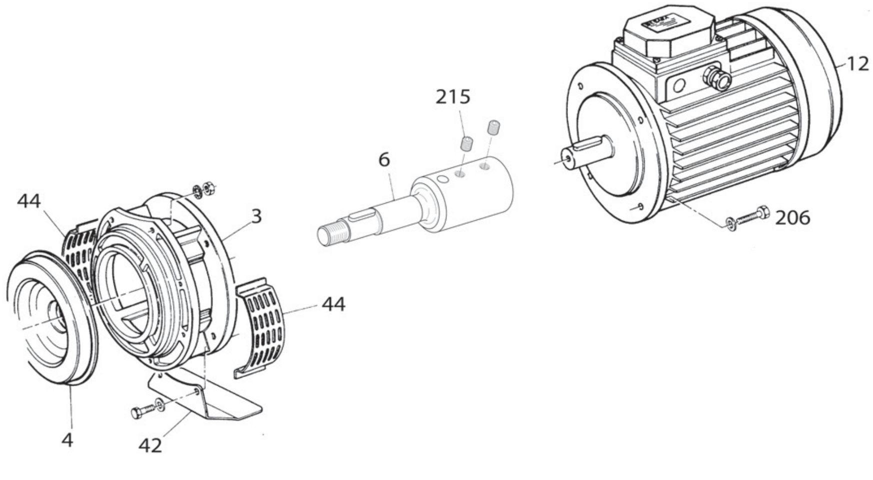


FIG. 3C

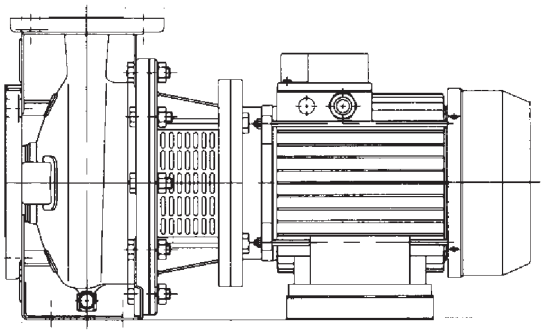


FIG. 3D

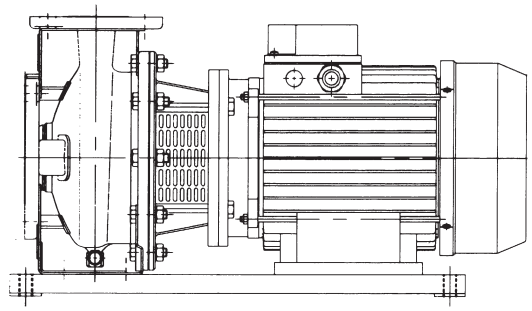


FIG. 4A

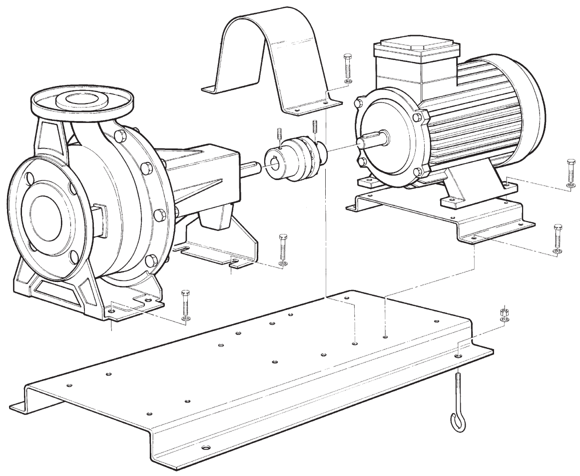
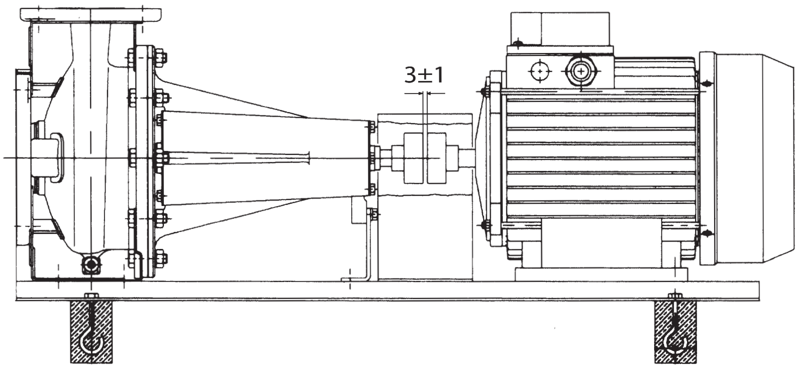


FIG. 4B



DICHIARAZIONE DI INCORPORAZIONE

1) Noi, EBARA PUMPS EUROPE S.p.A., dichiariamo sotto la ns. responsabilità che i ns. prodotti **"3PF"** (forniti senza motore) sono in conformità alla direttiva macchine 2006/42/CE.
2) I prodotti sopra nominati, non devono essere messi in servizio fino a quando il macchinario, in cui devono essere incorporati, non sia stato dichiarato conforme alle disposizioni della direttiva 2006/42/CE.

DECLARATION OF INCORPORATION

1) We, EBARA PUMPS EUROPE S.p.A., declare under our own responsibility that our products **"3PF"** (supplied without motor) are in conformity with the Machinery Directive 2006/42/CE.
2) The above-mentioned products must not be put into service until the machinery into which it is to be incorporated have been declared in conformity with the provisions of Directive 2006/42/CE.

DÉCLARATION D'INCORPORATION

1) Nous, EBARA PUMPS EUROPE S.p.A., déclarons sous notre responsabilité que nos produits **"3PF"** (fournis sans moteur) sont conformes à la Directive Machine Conseil 2006/42/CE.
2) Les produits mentionnés ci-dessus ne peuvent pas fonctionner jusqu'à ce que les machines dans lesquelles ils doivent être incorporés ne soient pas déclarées en conformité avec la Directive Machine Conseil 2006/42/CE.

ERKLÄRUNG FÜR DEN EINBAU

1) Die Firma, EBARA PUMPS EUROPE S.p.A., erklärt unter ihrer vollen Verantowortung, daß die Produkte **"3PF"** (ohne Motor geliefert) den Maschinenrichtlinien 2006/42/CE.
2) Die oben genannten Produkte dürfen nicht in Betrieb genommen werden, solange die Anlage in der sie eingebaut werden nicht den EU-Richtlinien 2006/42/CE. entsprechend erklärt wurde.

DECLARACIÓN DE INCORPORACIÓN

1) EBARA PUMPS EUROPE S.p.A., declara bajo su responsabilidad que sus productos **"3PF"** (suministrados sin motor) cumplen con la Directiva CE de Máquinas 2006/42/CE.
2) Los productos antes citados no deben ponerse en servicio hasta que la maquinaria en la cual deben instalarse sea declarada conforme a las disposiciones de la directiva 2006/42/CE.

INTYG AVSEENDE ÖVERENSSTÄMMELSE

1) Vi, EBARA PUMPS EUROPE S.p.A., intygar på eget ansvar att våra produkter **"3PF"** (levererade utan motor) uppgyller kraven enligt Rådets direktiv avseende maskiner 2006/42/CE.
2) Ovannämnda produkter kan inte tagas i bruk förrän maskinerna i vilka de skall installeras har intygats uppfylla kraven enligt föreskrifterna i EG:s direktiv avseende maskiner 2006/42/CE.

DEKLARACJA ZGODNOŚCI

1) My, niżej podpisani, EBARA PUMPS EUROPE S.p.A., oświadczamy, świadomi własnej odpowiedzialności, ze nasze produkty **"3PF"** (dostarczane bez silnika) odpowiadają wymogom dyrektywy maszynowej 2006/42/CE.
2) Produkty wymienione powyżej nie powinny być uruchamiane do chwili, gdy urządzenia, w których maja zostać zamontowane, nie zostaną zadeklarowane jako zgodne z zaleceniami dyrektywy 2006/42/CE.

ЗАЯВЛЕНИЕ О ВСТРАИВАНИИ

1) Мы, EBARA PUMPS EUROPE S.p.A., под свою ответственность заявляем, что изделия нашего производства **"3PF"** (поставляемые без двигателя) соответствуют директиве по машинам 2006/42/CE.
2) Указанные выше изделия не должны запускаться в эксплуатацию до тех пор, пока оборудование, в которое они должны встраиваться, не будет признано соответствующим положениям директивы 2006/42/CE.

شهادة إندماج

1) نحن شركة إيبارا بومبس (EBARA PUMPS EUROPE S.p.A.) نتعهد تحت مسؤوليتنا أن منتجاتنا **"3PF"** (المزوّدة بدون محرّك) تطابق قوانين التوجيهات الميكانيكية رقم 2006/42/CE

2) يجب عدم إستخدام المنتوجات المذكورة أعلاه إلى أن تكون مجموعة الألات التي سيتم دمج المنتوجات فيها مطابقة للتنظيمات الخاصة بقوانين الإتحاد الأوروبي 2006/42/CE

ERKLÆRING OM INKORPORERING

1) EBARA PUMPS EUROPE S.p.A. erklærer, under eget ansvar, at vores produkter **"3PF"** (leveret uden motorer) overholder Maskindirektivet 2006/42/CE.
2) Ovennævnte produkter må aldrig sættes i drift før anlægget, hvori de skal installeres, er blevet erklæret i overensstemmelse med direktiv 2006/42/CE.

VAATIMUSTENMUKAISUUSVAKUUTUS

1) EBARA PUMPS EUROPE S.p.A. ilmoittaa vastuullisena, että (ilman moottoria toimitettavat) **3PF**-tuotteet ovat koneita koskevan neuvoston direktiivin 2006/42/CE.
2) Edellä mainitut tuotteet saadaan ottaa käyttöön vasta kun koneistosta, johon ne liitetään, on annettu vakuutus direktiivin 2006/42/CE. vaatimusten mukaisuudesta.

VERKLARING VAN OVEREENSTEMMING VOOR MACHINEDELEN

1) Wij, EBARA PUMPS EUROPE S.p.A., verklaren onder onze verantwoordelijkheid dat onze producten **"3PF"** (geleverd zonder motor) overeenstemmen met de Machinerichtlijn 2006/42/CE.
2) Bovengenoemde producten mogen niet in werking worden gesteld totdat er verklaard is dat de machine, waarin zij geïntegreerd moeten worden, overeenstemt met de bepalingen van de richtlijn 2006/42/CE.

DECLARAÇÃO DE INCORPORAÇÃO

1) Nós, EBARA PUMPS EUROPE S.p.A., declaramos sob a nossa responsabilidade que os produtos **"3PF"** (fornecidos sem motor) estão conformes a Directriz Máquinas Conselho 2006/42/CE.
2) Os produtos acima denominados não devem ser usados, até que a maquinaria, na qual devem ser incorporados, ainda não foi declarada conforme a disposição da Directriz da 2006/42/CE.

ΔΉΛΩΣΗ ΕΝΣΩΜΆΤΩΣΗΣ

1) Εμείς η EBARA PUMPS EUROPE S.p.A. δηλώνουμε με δική μας ευθύνη, ότι τα προϊόντα μας **"3PF"** (άνευ κινητήρα) είναι εναρμονισμένα με την οδηγία μηχανημάτων Ε.Κ. 2006/42/CE.
2) Τα άνωθεν προϊόντα δεν μπορούν να χρησιμοποιηθούν μέχρις ότου το μηχάνημα, στο οποίο θα ενσωματωθούν, δηλωθεί εναρμονισμένο στις διατάξεις της οδηγίας Ε.Κ. 2006/42/CE.

PROHLÁŠENÍ O ZABUDOVÁNÍ

1) Firma EBARA PUMPS EUROPE S.p.A. prohlašuje na vlastní zodpovědnost, že naše výrobky **"3PF"** (dodávané bez motorů) odpovídají požadavkům směrnice o strojních zařízeních 2006/42/CE.
2) Shora uvedené výrobky nesmí být uvedeny do provozu, dokud zařízení, do kterého jsou zabudovány nebylo prohlášeno jako odpovídající předpisům směrnice 2006/42/CE.

PREHLÁSENIE O ZABUDOVANÍ

1) Firma EBARA PUMPS EUROPE S.p.A. prehlasuje na vlastnú zodpovednosť, že naše výrobky **"3PF"** (dodávané bez motorov) odpovedajú požiadavkám smernice o strojnom zariadení 2006/42/CE.
2) Hore uvedené výrobky nesmú byť uvedené do prevádzky, pokiaľ zariadenie, do ktorého sú zabudované, nebolo prehlásené ako odpovedajúce predpisom smernice 2006/42/CE.

ENTEGRASYON BEYANNAMESI

1) Biz, EBARA PUMPS EUROPE S.p.A. şirketi, (motorsuz olarak tedarik edilen) **"3PF"** ürünlerimizin AET 2006/42/CE.
2) Yukarıda adı geçen ürünler, bunların eklenecekleri makinenin, AET 2006/42/CE. sayılı yönerge hükümlerine uygunluğu beyan edilmedikçe kullanılmamalıdır.

Mr. SASAKI KENICHI
President

Sasaki

Brendola, 19 July 2006

SPECIFICATION

50Hz

Rev. M

Version				3M	3S	3P	3LM	3LS	3LP
Construction	Impeller			Closed centrifugal type for [32, 40, 50 version] Reinforced laser welding for [40-200/11, 50-200/15] Closed centrifugal three dimensional blades for [65 and 80 version]					
	Shaft seal type			Mechanical seal			Mechanical seal with stationary ring secured against rotation. Mechanical seal for [H-E option]		
	Bearing			Sealed ball bearing					
Pipe Connection	Suction	32-125/160/200		Flange DN50 according DIN 2532 standard					
		40-125/160/200		Flange DN65 according DIN 2532 standard					
		50-125/160/200		Flange DN65 according DIN 2532 standard					
		65-125/160/200/250		Flange DN80 according DIN 2532 standard					
		80-160/200/250		Flange DN100 according DIN 2532 standard					
	Discharge	32-125/160/200		Flange DN32 according DIN 2532 standard					
		40-125/160/200		Flange DN40 according DIN 2532 standard					
		50-125/160/200		Flange DN50 according DIN 2532 standard					
		65-125/160/200/250		Flange DN65 according DIN 2532 standard					
		80-160/200/250		Flange DN80 according DIN 2532 standard					
Material	Casing	32-125/160/200 40-125/160/200		EN 1.4301 (AISI 304)			EN 1.4404 (AISI 316L)		
		65-250 80-160/200/250		/			EN 1.4401 (AISI 316) Made by precision casting		
	Impeller	32-125/160/200 40-125/160/200 50-125/160		EN 1.4301 (AISI 304)			EN 1.4404 (AISI 316L)		
		65-125/160/200		EN 1.4401 (AISI 316) Made by precision casting					
		65-250 80-160/200/250		/			EN 1.4401 (AISI 316) Made by precision casting		
	Casing cover	32-125/160/200 40-125/160/200 50-125/160 65-125/160/200		EN 1.4301 (AISI 304)			EN 1.4404 (AISI 316L)		
		65-250 80-200/250		/			EN 1.4401 (AISI 316) Made by precision casting		
	Mechanical seal	32-125/160/200 40-125/160/200 50-125/160 65-125/160/200		**Ceramic/Carbon/NBR** [standard version] **Ceramic/Carbon/FPM** [H option] **SiC/SiC/FPM** [HS option] **Tungsten Carbide/Tungsten Carbide/FPM** [HW option] **SiC/Tungsten Carbide/FPM** [HSW option] **SiC/Carrbon/EPDM** [E option]			**SiC/SiC/FPM** [L version] **Ceramic/Carbon/FPM** [H option] **Tungsten Carbide/Tungsten Carbide/FPM** [HW option] **SiC/Tungsten Carbide/FPM** [HSW option] **SiC/Carrbon/EPDM** [E option]		
		65-250 80-160/200/250		/					
	O-ring			NBR [1]			FPM		
	Shaft	32, 40, 50 65-125 65-160/11	d=19	EN 1.4301 (AISI 304)			EN 1.4404 (AISI 316L)		
		50-200/15	d=22						
		65-160/15 65-200	d=24						
		65-250	d=24	/			EN 1.4462 (Duplex stainless steel)		
		80-160	d=24	/			EN 1.4404 (AISI 316L)		
		80-200/22	d=24	/			EN 1.4404		
		80-200/ 30-37kW	d=24	/			EN 1.4462 (Duplex stainless steel)		
		80-250	d=29	/			EN 1.4462 (Duplex stainless steel)		
	Bracket			Cast iron - aluminium					

[1] FPM for H-HS-HW-HSW version

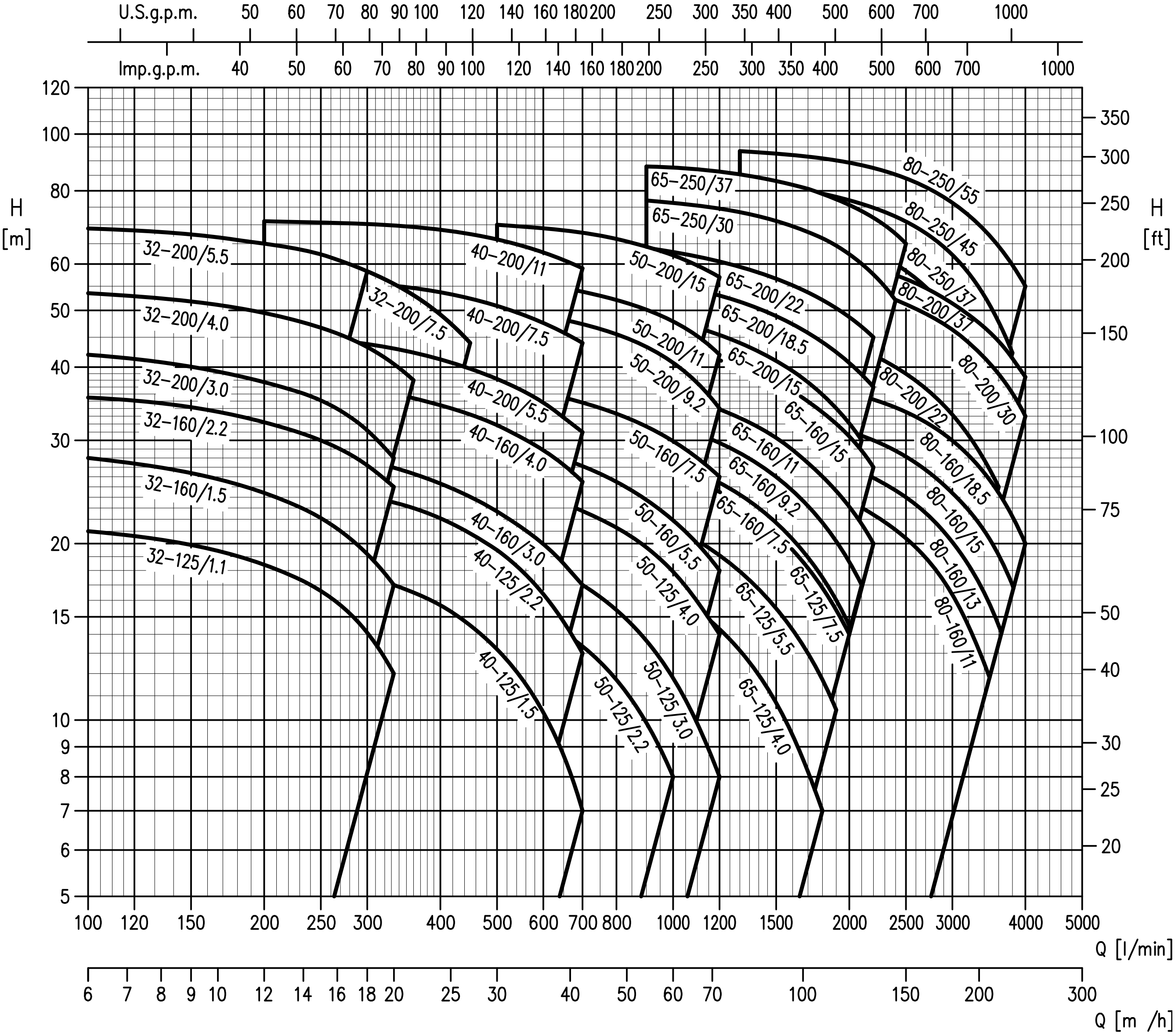
SPECIFICATION 50Hz

Rev. M

Version	3(.)M		3(.)S	3(.)P
Type	Electric-TEFC			
	Single Phase	Three phase		
Efficiency (Reg. 640/2009)	-	IE2 from 1.1 kW to 22 kW	IE2 from 1.1 kW to 55 kW	
No.of Poles	2			
Rotation speed [min^{-1}]	~2900			
Insulation class	F		F (temperature rise class B)	
Protection degree (CEI EN 60034-5)	IP 55			
Power rating [kW]	1.1 ÷ 2.2	1.1 ÷ 22	1.1 ÷ 55	
Power rating [HP]	1.5 ÷ 3.0	1.5 ÷ 30	1.5 ÷ 75	
Frequency [HZ]	50			
Voltage [V]	230 ±10%	230/400 ±10% (up to 4.0 kW) 400/690 ±10% (5.5 kW and above)		
Casing material	Aluminium / Cast iron			
Dimensions of cable entry	M20x1.5	-PG 13.5 -PG 16 -PG 21	- M20x1.5 - M25x1.5 - M32x1.5 - M40x1.5 - M50x1.5 - M63x1.5	
Flange mount (IEC motor)	/		IM B5 (up to 2.2 kW) IM B35 (3.0 kw and above)	IM B3

SELECTION CHART 50Hz

Rev. M



SELECTION CHART

50Hz

Rev. M

3 SERIES: 32, 40, 50 VERSION

Pump type	Power [kW]	Power [HP]	l/min 0	100	150	200	300	333	360	400	450	500	600	700	800	1000	1200
			m³/h 0	6	9	12	18	20	22	24	27	30	36	42	48	60	72
32-125/1.1(M) *	1.1	1.5	22.5	21	19.9	18.4	14.1	12	-	-	-	-	-	-	-	-	-
32-160/1.5(M) *	1.5	2	29.5	28	26.5	24.5	19.2	17	-	-	-	-	-	-	-	-	-
32-160/2.2(M) *	2.2	3	37	35.5	34	32	27	25	-	-	-	-	-	-	-	-	-
32-200/3.0	3	4	44	42	40	37.5	31	28	-	-	-	-	-	-	-	-	-
32-200/4.0	4	5.5	55	53.5	52	49.5	43.5	40.5	38	-	-	-	-	-	-	-	-
32-200/5.5	5.5	7.5	70.5	69	67.5	65	58.5	-	-	-	-	-	-	-	-	-	-
32-200/7.5	7.5	10	70.5	69	67.5	65	58.5	55.5	53	49	44	-	-	-	-	-	-
40-125/1.5(M) *	1.5	2	20	-	-	19	17.6	17	16.5	15.7	14.5	13.2	10.3	7	-	-	-
40-125/2.2(M) *	2.2	3	26.5	-	-	25.5	24	23.5	23	22	21	19.5	16.4	13	-	-	-
40-160/3.0	3	4	31	-	-	29.5	27.5	27	26.5	25.5	24	22.5	20	17	-	-	-
40-160/4.0	4	5.5	40	-	-	38.5	37	36	35.5	34.5	33	32	29	25.5	-	-	-
40-200/5.5	5.5	7.5	47	-	-	45.5	44	43	42.5	41	39.5	38	35	31	-	-	-
40-200/7.5	7.5	10	58	-	-	57	55.5	55	54.5	53.5	52.5	51	47.5	44	-	-	-
40-200/11	11	15	72	-	-	71	70	70	69.5	68.5	67.5	66	63	59	-	-	-
50-125/2.2(M) *	2.2	3	19	-	-	-	-	-	-	17.5	17	16.3	14.9	13.4	11.7	8	-
50-125/3.0	3	4	22	-	-	-	-	-	-	20.5	20	19.6	18.4	17	15.4	11.8	8
50-125/4.0	4	5.5	26.5	-	-	-	-	-	-	26	25.5	25	24	22.5	21.5	17.9	14
50-160/5.5	5.5	7.5	33	-	-	-	-	-	-	31	30.5	30	28.5	27	25.5	22	18
50-160/7.5	7.5	10	40	-	-	-	-	-	-	38.5	38	37.5	36	35	33.5	30	26
50-200/9.2	9.2	12.5	53	-	-	-	-	-	-	-	-	50	49	47.5	45.5	40.5	34
50-200/11	11	15	59	-	-	-	-	-	-	-	-	56	55	54	52	48	42
50-200/15	15	20	72	-	-	-	-	-	-	-	-	70	69	68	66	62	57

3 SERIES: 65, 80 VERSION

Pump type	Power [kW]	Power [HP]	l/min 0	600	700	900	1300	1500	1700	1900	2100	2200	2300	2400	2500	3000	3400	3600	3800	4000
			m³/h 0	36	42	54	78	90	102	114	126	132	138	144	150	180	204	216	228	240
65-125/4.0	4	5.5	22.2	19.8	19	17.3	13.3	11	8.6	6.3	-	-	-	-	-	-	-	-	-	-
65-125/5.5	5.5	7.5	27	-	24	22.2	18	15.7	13.3	10.8	8	-	-	-	-	-	-	-	-	-
65-125/7.5	7.5	10	32	-	29.5	27.8	23.5	21.1	18.7	16.1	13.4	12	-	-	-	-	-	-	-	-
65-160/7.5	7.5	10	32	-	30	28.6	24.8	22.5	19.9	17.1	14.2	-	-	-	-	-	-	-	-	-
65-160/9.2	9.2	12.5	36.5	-	34.5	32.8	28.8	26.5	23.9	21.1	18.3	16.8	-	-	-	-	-	-	-	-
65-160/11	11	15	40.5	-	38.5	37.1	33.1	30.9	28.4	25.8	23	21.5	20	-	-	-	-	-	-	-
65-160/15	15	20	48	-	45.5	44	40	37.8	35.3	32.6	29.6	28	26.5	-	-	-	-	-	-	-
65-200/15	15	20	53.5	-	51	49	44	41.5	38.4	35.3	31.8	30	-	-	-	-	-	-	-	-
65-200/18.5	18.5	25	60.5	-	58.5	56.5	51.5	49	46	43	39.7	38	36.3	-	-	-	-	-	-	-
65-200/22	22	30	67	-	65.5	64	59.5	57	54	51	48	46.5	45	-	-	-	-	-	-	-
65-250/30	30	40	78	-	-	77	73.5	71	68	64.5	60	57.5	55	52	-	-	-	-	-	-
65-250/37	37	50	89	-	-	88	85.5	83	80.5	77.5	74	72	70	67.5	65	-	-	-	-	-
80-160/11	11	15	29	-	-	-	27.3	26.4	25.4	24.2	23	22.4	21.8	21.1	20.4	16.4	12.5	-	-	-
80-160/13	13	17.5	32	-	-	-	30.5	29.7	28.8	27.7	26.5	25.9	25.3	24.6	24	20.1	16.5	14.5	-	-
80-160/15R	15	20																		
80-160/15			35	-	-	-	34	33.3	32.5	31.5	30.5	30	29.4	28.8	28.1	24.4	21	19.1	17	-
80-160/18.5	18.5	25	40	-	-	-	39	38.4	37.6	36.7	35.7	35.2	34.7	34.1	33.5	30	26.4	24.4	22.3	20
80-200/22	22	30	50	-	-	-	48	47	45.5	44.5	43	42	41	40	39	33.2	27.8	25	-	-
80-200/30	30	40	60	-	-	-	58.5	58	57	56	54.5	54	53	52	51	46.5	41.5	39	36.1	33
80-200/37	37	50	66	-	-	-	64	63	62	61	59.5	59	58	57.5	56.5	51.5	47	44.5	41.5	38.5
80-250/37	37	50	73	-	-	-	71.5	70.5	68.5	66.5	64	63	61.5	60	58.5	48.5	38	-	-	-
80-250/45	45	60	84	-	-	-	82.5	81.5	80	78	76	75	73.5	72.5	71	62	53	48	42.5	-
80-250/55	55	75	95	-	-	-	93.5	92.5	91.5	90	88.5	87.5	86.5	85.5	84	76.5	68.5	64.5	60	55

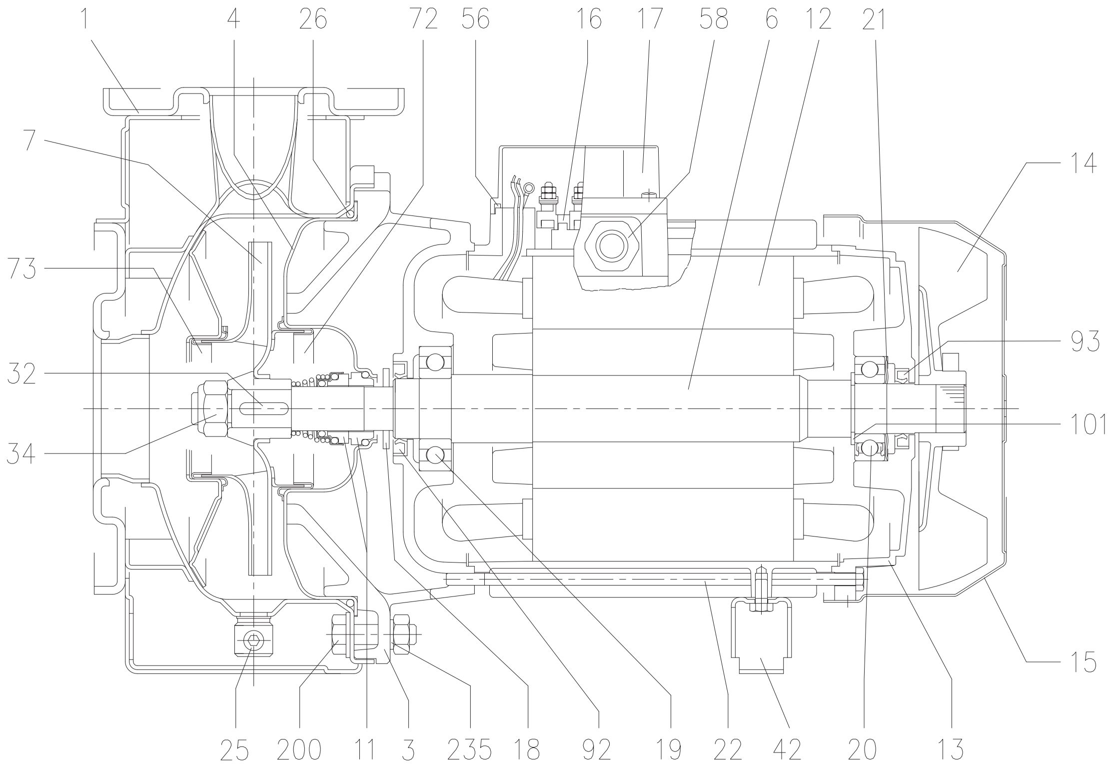
CONSTRUCTION

50Hz

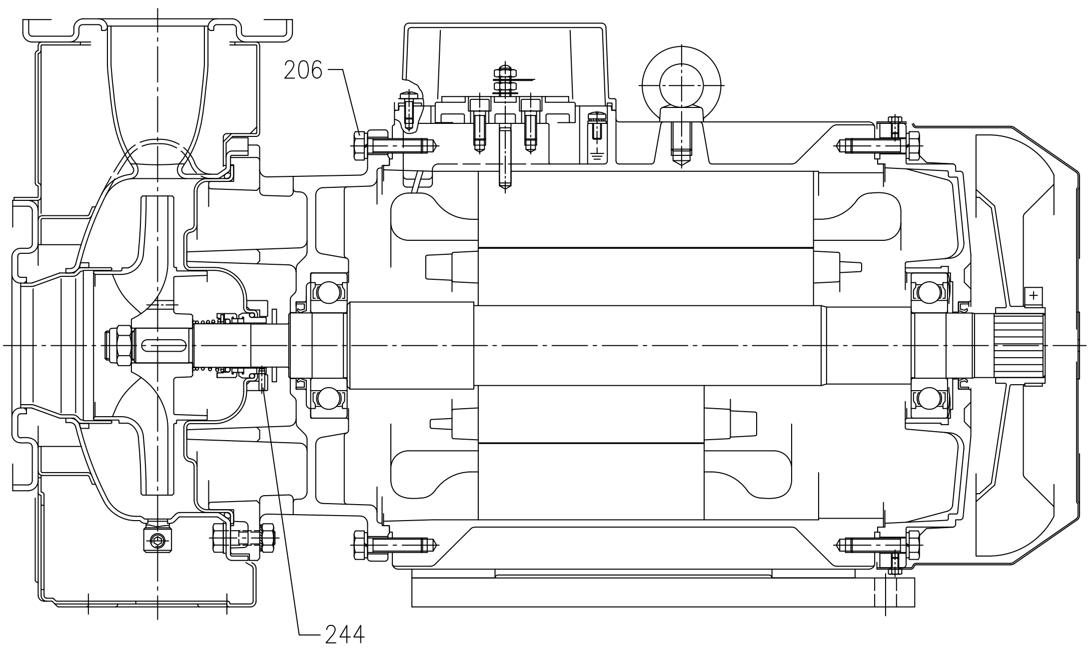
Rev. M

SECTIONAL VIEW DRAWING 3(.)M 32, 40, 50, 65-125/160/200

UP TO 11 kW



15 kW AND ABOVE



SECTIONAL VIEW TABLE 3(.)M 32, 40, 50, 65-125/160/200

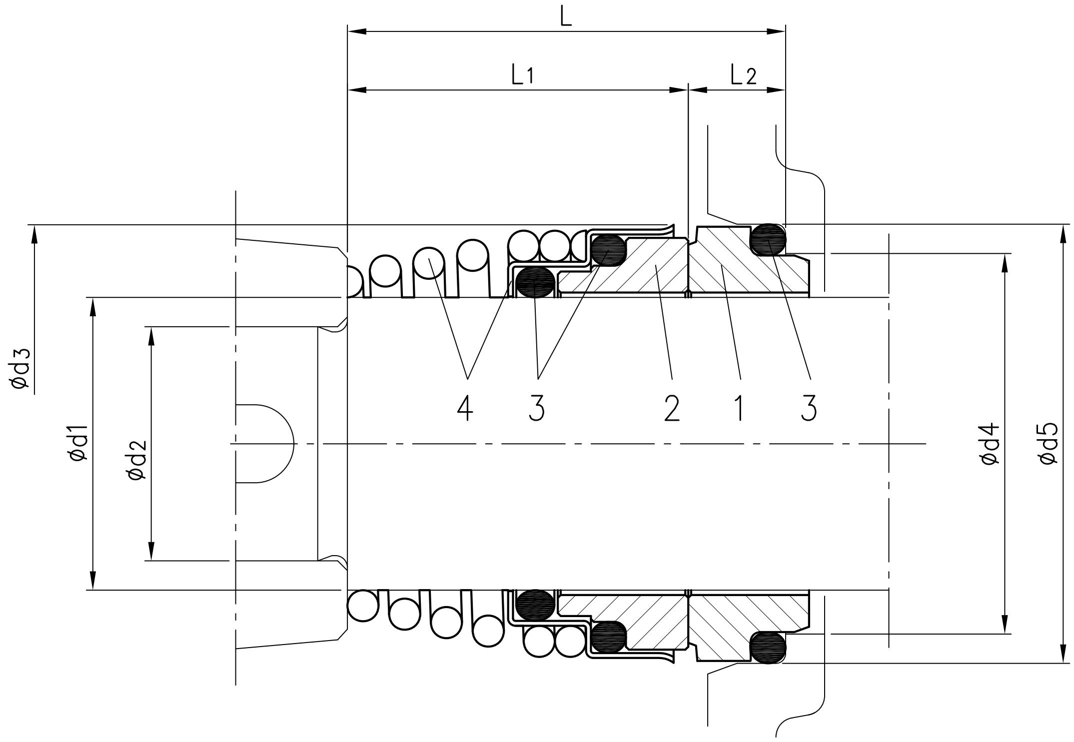
N°	PART NAME		MATERIAL 3M	MATERIAL 3LM	DIMENSIONS	STANDARD	N. FOR
001	Casing		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
003	Motor bracket		Cast iron EN-GJL-200-EN 1561				1
004	Casing cover		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
006	Shaft with rotor-Part in contact with liquid		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
007	Impeller		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
011	Mechanical seal [9]		Carbon/Ceramic/NBR	SiC/SiC/FPM	See p. 321-326		1
012	Motor frame with stator		-				1
013	Motor cover		Aluminium				1
014	Fan		PA				1
015	Fan cover		Fe P04 Zinc-coated				1
016	Terminal		-				1
017	Terminal box cover		Aluminium (three phase version)				1
018	Splash ring	Up to 11 kW	NBR	/	40x21.5x3	EBARA DRAWING	[1]
		15 kW and above			50x29.5x3		
019	Bearing		-		See table p.319		1
020	Bearing		-		See table p.319		1
021	Adjusting ring		Steel C70				1
022	Tie rod	Up to 3 kW	Fe 42 Zinc-coated		M5	EBARA DRAWING	4
		For 4 - 5.5 - 7.5 kW			M6		
		9.2 e 11kW			M8		
	Screw	15 kW and above	Zn. Steel 8.8 strenght class ISO 898-1		M10x40	UNI 5739	
25	Draing plug		EN 1.4401 (AISI 316) / PTFE		R 1/8" L=8	DIN 906	1
026	"O" ring	32-125, 40-125	NBR [8]	FPM	158.11x5.34	OR 6625	1
		32-160, 40-160, 50-125, 65-160			183.52x5.34	OR 6720	
		32-200, 40-200,50-160, 50-200, 65-160, 65-200			227.96x5.34	OR 6895	
032	Key	Up to 11 kW	EN 1.4401 (AISI 316)		A 6x6x25	UNI 6604	1
		15 kW and above			A 8x7x30		
034	Impeller nut	Up to 11kW	EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)	M16x1.5	UNI 7474	1
		50-200/15			M18x1.5		
		15 kW and above			M20x1.5		
042	Foot		Aluminium / Zinc-coated steel			EBARA DRAWING	[2]
056	Box gasket		NBR				1
058	Fasting nut		-				[3]
072	Casing ring [4]		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
073	Casing ring		EN 1.4301 (AISI 304)	EN 1.4404 (AISI 316L)			1
092	Lip seal	Up to 3kW	-	-	25x40x7	DIN 3760 without spring	1
		From 4 to 7.5 kW			30x47X7		
		From 9.2 kW to 11 kW			40x55x7		
		From 15 kW to 22 kW			45x60x7		
093	Lip seal	Up to 4 kW	-	-	25x40x7	DIN 3760 without spring	1
		From 5.5 kW to 7.5 kW			30x47X7		
		From 9.2 kW to 11 kW			40x55x7		
		From 15 kW to 22 kW			45x60x7		
101	Snap ring (only 9.2 and 11kW)		Carbon tool steels TC 80		Ø 40	UNI 7435	1
200	Screw	32-125, 40-125	Stainless steel A2 70 class ISO 3506/1		M 8x30	UNI 5739	8
		40-160, 40-200, 50-125, 50-160, 50-200, 65-125, 65-160, 65-200			M 10x35		[5]
235	Washer	32-125, 40-125	EN 1.4301 (AISI 304)		8.4x17	UNI 6592	8
		40-160, 40-200, 50-125, 50-160, 50-200, 65-125, 65-160, 65-201			10.5x21		[5]
206	Screw for bracket [6]		Zn. Steel 8.8 strenght class ISO 898-1		M 10x40	UNI 5739	4
244	Pin [7]		-	EN 1.4301 (AISI 304)	4x15		1

Counterflange kit on request, see table p. 328-329
[1] Not for L version
[2] Quantity =0 for 65-160/15
Quantity =1 for 32-40-50 and 65 up to 11kW
Quantity =2 for 65-200/15, 65-200/18.5, 65-200/22
[3] Quantity =1 up to 11kW
Quantity =2 from 15kW to 22kW
[4] For version 32-200/3, 32-200/4, 32-200/5.5, 40-200/5.5, 40-200/7.5, 40-200/11, 50-160/5.5, 50-160/7.5, 50-200/9.2, 50-200/11, 50-200/15
[5] Quantity =10 for 32-160, 40-160, 50-125, 65-125
Quantity =12 for 32-200, 40-200, 50-160, 50-200, 65-160, 65-200
[6] For 15kW and above
[7] Only for 65-160/15 and 65-200
[8] FPM for H-HS-HW-HSW version
EPDM for E version
[9]] Special version: see page 321 and following

BEARINGS 3(.)M

Pump type		Ball bearing	
Single Phase 50 Hz	Three Phase 50 Hz	Pump side	Fan side
3(.)M 32-125/1.1 M	3(.)M 32-125/1.1	6205-SRSH	6205-SRSH
3(.)M 32-160/1.5 M	3(.)M 32-160/1.5		
3(.)M 32-160/2.2 M	3(.)M 32-160/2.2		
-	3(.)M 32-200/3		
	3(.)M 32-200/4	6206-2RS1	
	3(.)M 32-200/5.5	6306-2RS1	6206-2RS1
	3(.)M 32-200/7.5		
3(.)M 40-125/1.5 M	3(.)M 40-125/1.5	6205-SRSH	6205-SRSH
3(.)M 40-125/2.2 M	3(.)M 40-125/2.2		
-	3(.)M 40-160/3		
	3(.)M 40-160/4	6206-2RS1	
	3(.)M 40-200/5.5	6306 2RS1	6206-2RS1
	3(.)M 40-200/7.5		
	3(.)M 40-200/11	6308-2RS1	6208-2RS1
3(.)M 50-125/2.2 M	3(.)M 50-125/2.2	6205-SRSH	6205-SRSH
-	3(.)M 50-125/3		
	3(.)M 50-125/4	6206-2RS1	
	3(.)M 50-160/5.5	6306-2RS1	6206-2RS1
	3(.)M 50-160/7.5		
	3(.)M 50-200/9.2	6308-2RS1	6208-2RS1
	3(.)M 50-200/11		
	3(.)M 50-200/15	6309-2RS1	6309-2RS1
	3(.)M 65-125/4	6206-2RS1	6205-SRSH
	3(.)M 65-125/5.5	6306-2RS1	6206-2RS1
	3(.)M 65-125/7.5		
	3(.)M 65-160/7.5		
	3(.)M 65-160/9.2	6308-2RS1	6208-2RS1
	3(.)M 65-160/11		
	3(.)M 65-160/15	6309-2RS1	6309-2RS1
	3(.)M 65-200/15		
	3(.)M 65-200/18.5		
	3(.)M 65-200/22		
	3LM 80-160/11	6308-2RS1	6208-2RS1
	3LM 80-160/13		
	3LM 80-160/15	6309-2RS1	6309-2RS1
	3LM 80-160/18.5		

MECHANICAL SEAL STANDARD AND H VERSION



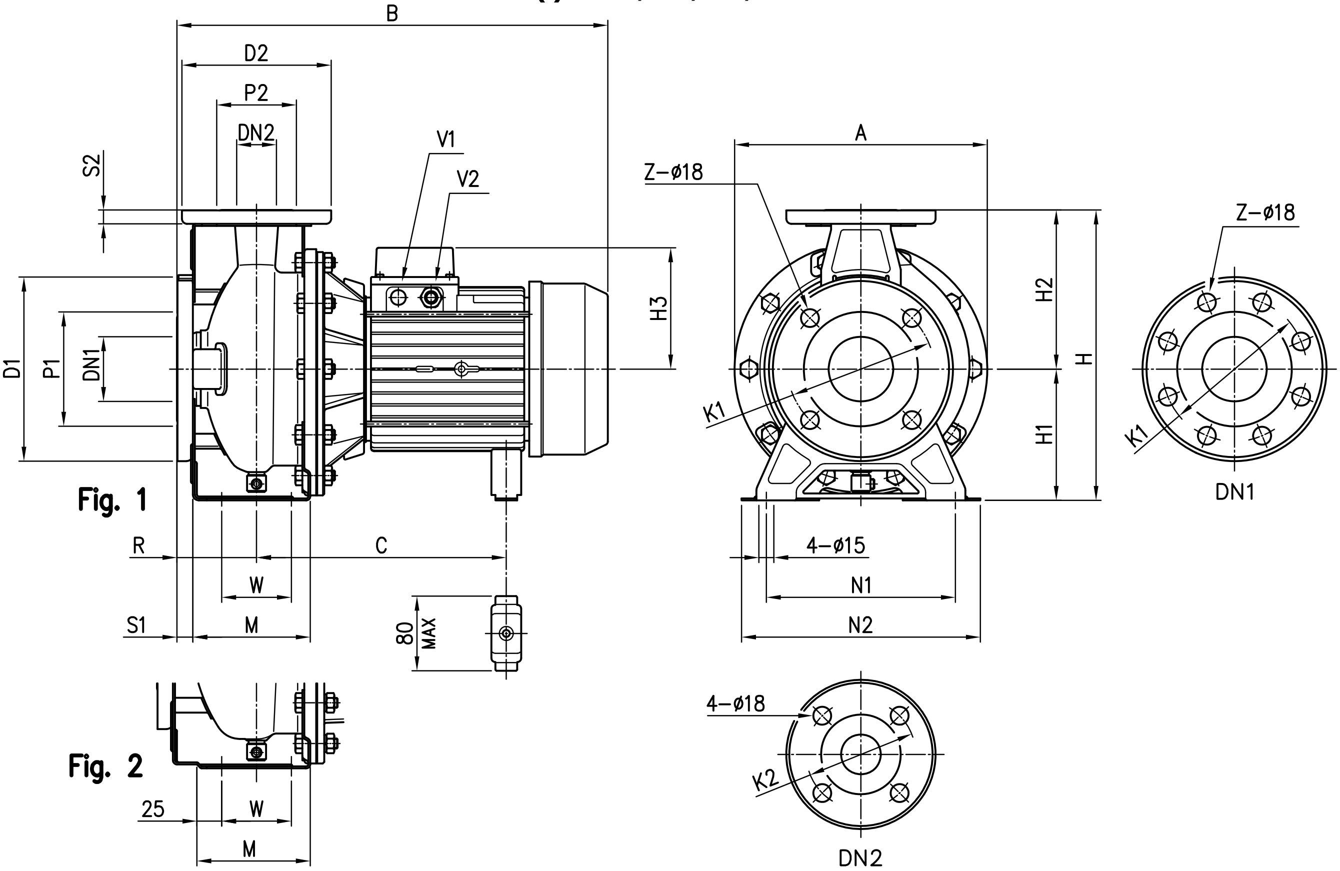
Version	Pump type	Dimensions								Material			
		d1	d2	d3	d4	d5	L	L1	L2	**1** Stationary seal ring	**2** Rotary seal ring	**3** rubber	**4** Frame + spring
Standard	32-125/160/200 40-125/160/200 50-125/160/200 65-125 65-160/7.5 65-160/9.2 65-160/11	22	19	38	31	37	37.5	27.5	10	Carbon	Ceramic	NBR	EN 1.4401 (AISI 316)
	65-160/15 65-200	30	24	46	39	45	42.5	32.5	10				
H	32-125/160/200 40-125/160/200 50-125/160/200 65-125 65-160/7.5 65-160/9.2 65-160/11	22	19	38	31	37	37.5	27.5	10	Carbon	Ceramic	FPM	EN 1.4401 (AISI 316)
	65-160/15 65-200 65-250 80-160/200	30	24	46	39	45	42.5	32.5	10				
	80-250	35	29	50	44	50	42.5	32.5	10				

DIMENSIONS AND WEIGHT

50Hz

Rev. M

PUMP 3(.)M 32, 40, 50, 65-125/160



Model	Dimensions (mm)																																Weight [kgf]	
	Ø DN1	Ø P1	Ø K1	Ø D1	S1	Z [1]	Z [2]	Ø DN2	Ø P2	Ø K2	Ø D2	S2	Fig.	H	H1	H2	H3 [3~]	H3 [1~]	R	W	M	N1	N2	A	B [1~]	B [3~]	C [1~]	C [3~]	V1 [3~]	V2 [3~]	V2 [1~]	[1~]	[3~]
32-125/1.1 (M)	50	95	125	165	16	4	-	32	75	100	140	14	1	252	112	140	124	141	80	70	114	140	190	213	408	407	219÷230	219÷230	-	PG 13.5	M20x1.5	19.6	24.1
32-160/1.5 (M)	50	95	125	165	16	4	-	32	75	100	140	14	1	292	132	160	124	141	80	70	118	190	240	254	408	407	219÷230	219÷230	-	PG 13.5	M20x1.5	22.5	27
32-160/2.2 (M)	50	95	125	165	16	4	-	32	75	100	140	14	1	292	132	160	124	141	80	70	118	190	240	254	408	432	219÷230	244÷255	-	PG 13.5	M20x1.5	27.7	28
32-200/3.0	50	95	125	165	16	4	-	32	75	100	140	14	1	340	160	180	124	-	80	70	119	190	240	296	-	471	-	244÷255	-	PG 13.5	-	-	35.1
32-200/4.0	50	95	125	165	16	4	-	32	75	100	140	14	1	340	160	180	141	-	80	70	119	190	240	296	-	494	-	253	-	PG 16	-	-	38.2
32-200/5.5	50	95	125	165	16	4	-	32	75	100	140	14	1	340	160	180	150	-	80	70	119	190	240	296	-	519	-	275	PG 13.5	PG 16	-	-	52.2
32-200/7.5	50	95	125	165	16	4	-	32	75	100	140	14	1	340	160	180	150	-	80	70	119	190	240	296	-	519	-	275	PG 13.5	PG 16	-	-	57
40-125/1.5 (M)	65	115	145	185	16	4	-	40	80	110	150	14	1	252	112	140	124	141	80	70	114	160	210	213	408	407	219÷230	219÷230	-	PG 13.5	M20x1.5	20,1	24.6
40-125/2.2 (M)	65	115	145	185	16	4	-	40	80	110	150	14	1	252	112	140	124	141	80	70	114	160	210	213	408	432	219÷230	244÷255	-	PG 13.5	M20x1.5	25,8	26.1
40-160/3.0	65	115	145	185	16	4	-	40	80	110	150	14	1	292	132	160	124	-	80	70	118	190	240	254	-	471	-	244÷255	-	PG 13.5	-	-	26.6
40-160/4.0	65	115	145	185	16	4	-	40	80	110	150	14	1	292	132	160	141	-	80	70	118	190	240	254	-	494	-	253	-	PG 16	-	-	40.8
40-200/5.5	65	115	145	185	16	4	-	40	80	110	150	14	2	340	160	180	150	-	100	70	115	212	265	296	-	539	-	275	PG 13.5	PG 16	-	-	52.5
40-200/7.5	65	115	145	185	16	4	-	40	80	110	150	14	2	340	160	180	150	-	100	70	115	212	265	296	-	539	-	275	PG 13.5	PG 16	-	-	56.2
40-200/11	65	115	145	185	16	4	-	40	80	110	150	14	2	340	160	180	178	-	100	70	115	212	265	296	-	595	-	359	PG 13.5	PG 21	-	-	67.2
50-125/2.2 (M)	65	115	145	185	16	4	-	50	95	125	165	16	2	292	132	160	124	141	100	70	114	190	240	254	428	452	219÷230	244÷255	-	PG 13.5	M20x1.5	29,4	32
50-125/3.0	65	115	145	185	16	4	-	50	95	125	165	16	2	292	132	160	124	-	100	70	114	190	240	254	-	491	-	244÷255	-	PG 13.5	-	-	30.9
50-125/4.0	65	115	145	185	16	4	-	50	95	125	165	16	2	292	132	160	141	-	100	70	114	190	240	254	-	514	-	253	-	PG 16	-	-	40.9
50-160/5.5	65	115	145	185	16	4	-	50	95	125	165	16	2	340	160	180	150	-	100	70	115	212	265	296	-	539	-	275	PG 13.5	PG 16	-	-	46.5
50-160/7.5	65	115	145	185	16	4	-	50	95	125	165	16	2	340	160	180	150	-	100	70	115	212	265	296	-	539	-	275	PG 13.5	PG 16	-	-	55.5
50-200/9.2	65	115	145	185	16	4	-	50	95	125	165	16	2	360	160	200	178	-	100	70	115	212	265	296	-	595	-	359	PG 13.5	PG 21	-	-	63.9
50-200/11	65	115	145	185	16	4	-	50	95	125	165	16	2	360	160	200	178	-	100	70	115	212	265	296	-	595	-	359	PG 13.5	PG 21	-	-	67.2
65-125/4	80	134	160	200	18	8	4	65	115	145	185	16	2	340	160	180	141	-	100	95	140	212	280	254	-	514	-	253	-	PG 16	-	-	37.7
65-125/5,5	80	134	160	200	18	8	4	65	115	145	185	16	2	340	160	180	150	-	100	95	140	212	280	254	-	539	-	275	PG 13.5	PG 16	-	-	48,7
65-125/7,5	80	134	160	200	18	8	4	65	115	145	185	16	2	340	160	180	150	-	100	95	140	212	280	254	-	539	-	275	PG 13.5	PG 16	-	-	49
65-160/7,5	80	134	160	200	18	8	4	65	115	145	185	16	2	360	160	200	150	-	100	95	140	212	280	296	-	539	-	275	PG 13.5	PG 16	-	-	52.2
65-160/9,2	80	134	160	200	18	8	4	65	115	145	185	16	2	360	160	200	178	-	100	95	140	212	280	296	-	595	-	359	PG 13.5	PG 21	-	-	61
65-160/11	80	134	160	200	18	8	4	65	115	145	185	16	2	360	160	200	178	-	100	95	140	212	280	296	-	595	-	359	PG 13.5	PG 21	-	-	65

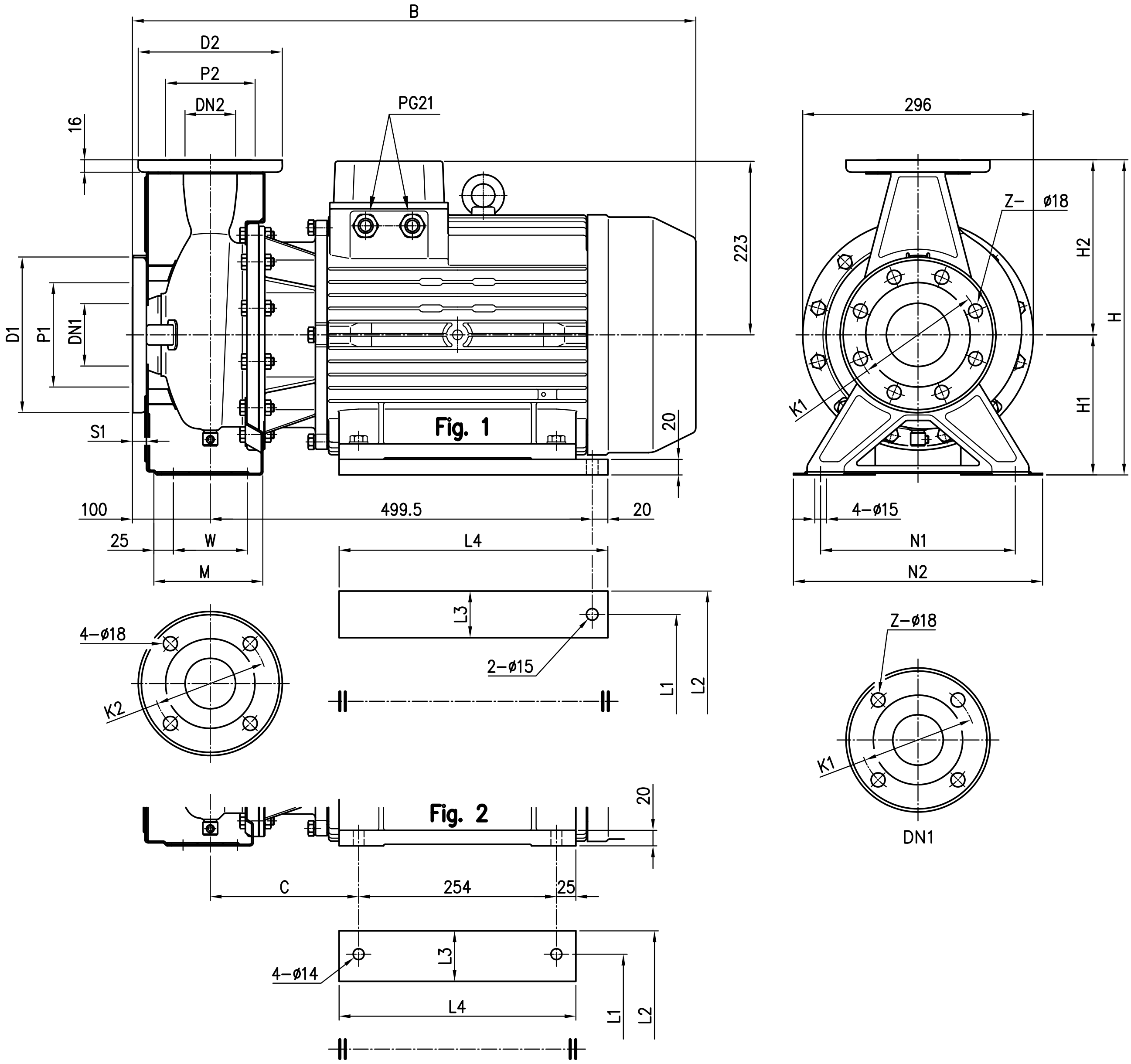
[1] Standard [2] On request [1~] Only for single phase [3~] Only for three phase

DIMENSIONS AND WEIGHT

50Hz

Rev. M

PUMP 3(.)M 50-200, 65-160/15, 65-200



Model	Dimensions [mm]																										Weight [kgf]
	Ø DN1	Ø P1	Ø K1	Ø D1	S1	Z [1]	Z [2]	Ø DN2	Ø P2	Ø K2	Ø D2	Fig.	H	H1	H2	W	M	N1	N2	B	C	L1	L2	L3	L4		
50-200/15	65	115	145	185	16	4	-	50	95	125	165	2	360	160	200	70	115	212	265	723	190.5	254	318	65	304		102
65-160/15	80	134	160	200	18	8	4	65	115	145	185	2	360	160	200	95	140	212	280	732	199.5	254	318	65	304		104
65-200/15	80	134	160	200	18	8	4	65	115	145	185	1	405	180	225	95	140	250	320	732	-	254	314	60	345		107
65-200/18.5	80	134	160	200	18	8	4	65	115	145	185	1	405	180	225	95	140	250	320	732	-	254	314	60	345		119
65-200/22	80	134	160	200	18	8	4	65	115	145	185	1	405	180	225	95	140	250	320	732	-	254	314	60	345		130

[1] Standard [2] On request

TECHNICAL DATA

50Hz

Rev. M

MOTOR DATA 3(.)M

Pump type		Power		Efficiency		Capacitor		Efficiency (% load) Three phase η %			Input [kW]		Full load current [A]				Locked rotor current [A]			
Single Phase	Three Phase	[kW]	[HP]	Single Phase	Three Phase	Single Phase [µF]	[V]	50%	75%	100%	Single Phase	Three Phase	Single Phase 230 V	Three Phase 230 V	400 V	690 V	Single Phase 230 V	Three Phase 230 V	400 V	690 V
3(.)M 32-125/1.1 M	3(.)M 32-125/1.1	1.1	1.5	-	IE2	31.5	450	79.5	82.0	82.5	1.51	1.82	6.7	5.5	3.2	-	23.5	57.0	33.0	-
3(.)M 32-160/1.5 M	3(.)M 32-160/1.5	1.5	2.0	-	IE2	40	450	79.5	82.0	82.5	2.10	1.82	9.6	5.5	3.2	-	47	57.0	33.0	-
3(.)M 32-160/2.2 M	3(.)M 32-160/2.2	2.2	3.0	-	IE2	50	450	83.1	85.7	86.2	2.95	2.55	13.3	7.8	4.5	-	63.8	75.0	43.5	-
-	3(.)M 32-200/3.0	3.0	4.0	-	IE2	-	-	85.0	86.7	86.3	-	3.48	-	10.6	6.1	-	-	100.0	57.7	-
-	3(.)M 32-200/4.0	4.0	5.5	-	IE2	-	-	84.3	87.2	87.8	-	4.56	-	15.1	8.7	-	-	151.0	87.0	-
-	3(.)M 32-200/5.5	5.5	7.5	-	IE2	-	-	82.9	86.0	87.4	-	6.29	-	-	10.4	6.0	-	-	116.0	67.0
-	3(.)M 32-200/7.5	7.5	10.0	-	IE2	-	-	86.1	88.2	88.8	-	8.45	-	-	13.7	7.9	-	-	140.0	81.0
3(.)M 40-125/1,5 M	3(.)M 40-125/1.5	1.5	2.0	-	IE2	40	450	79.5	82.0	82.5	2.10	1.82	9.6	5.5	3.2	-	47	57.0	33.0	-
3(.)M 40-125/2.2 M	3(.)M 40-125/2.2	2.2	3.0	-	IE2	50	450	83.1	85.7	86.2	2.95	2.55	13.3	7.8	4.5	-	63.8	75.0	43.5	-
-	3(.)M 40-160/3.0	3.0	4.0	-	IE2	-	-	85.0	86.7	86.3	-	3.48	-	10.6	6.1	-	-	100.0	57.7	-
-	3(.)M 40-160/4.0	4.0	5.5	-	IE2	-	-	84.3	87.2	87.8	-	4.56	-	15.1	8.7	-	-	151.0	87.0	-
-	3(.)M 40-200/5.5	5.5	7.5	-	IE2	-	-	82.9	86.0	87.4	-	6.29	-	-	10.4	6.0	-	-	116.0	67.0
-	3(.)M 40-200/7.5	7.5	10.0	-	IE2	-	-	86.1	88.2	88.8	-	8.45	-	-	13.7	7.9	-	-	140.0	81.0
-	3(.)M 40-200/11	11.0	15.0	-	IE2	-	-	88.9	90.3	90.2	-	12.20	-	38.0	21.9	-	-	322.0	186.0	-
3(.)M 50-125/2.2 M	3(.)M 50-125/2.2	2.2	3.0	-	IE2	50	450	83.1	85.7	86.2	2.95	2.55	13.3	7.8	4.5	-	63.8	75.0	43.5	-
-	3(.)M 50-125/3.0	3.0	4.0	-	IE2	-	-	85.0	86.7	86.3	-	3.48	-	10.6	6.1	-	-	100.0	57.7	-
-	3(.)M 50-125/4.0	4.0	5.5	-	IE2	-	-	84.3	87.2	87.8	-	4.56	-	15.1	8.7	-	-	151.0	87.0	-
-	3(.)M 50-160/5.5	5.5	7.5	-	IE2	-	-	82.9	86.0	87.4	-	6.29	-	-	10.4	6.0	-	-	116.0	67.0
-	3(.)M 50-160/7.5	7.5	10.0	-	IE2	-	-	86.1	88.2	88.8	-	8.45	-	-	13.7	7.9	-	-	140.0	81.0
-	3(.)M 50-200/9.2	9.2	12.5	-	IE2	-	-	88.6	90.0	89.9	-	10.23	-	-	16.8	9.7	-	-	166.0	96.0
-	3(.)M 50-200/11	11.0	15.0	-	IE2	-	-	88.9	90.3	90.2	-	12.20	-	-	21.9	12.7	-	-	186.0	108.0
-	3(.)M 50-200/15	15.0	20.0	-	IE2	-	-	89.3	91.0	91.1	-	16.47	-	-	28.3	16.4	-	-	246.0	143.0
-	3(.)M 65-125/4	4.0	5.5	-	IE2	-	-	84.3	87.2	87.8	-	4.56	-	15.1	8.7	-	-	151.0	87.0	-
-	3(.)M 65-125/5.5	5.5	7.5	-	IE2	-	-	82.9	86.0	87.4	-	6.29	-	-	10.4	6.0	-	-	116.0	67.0
-	3(.)M 65-125/7.5	7.5	10.0	-	IE2	-	-	86.1	88.2	88.8	-	8.45	-	-	13.7	7.9	-	-	140.0	81.0
-	3(.)M 65-160/7.5	7.5	10.0	-	IE2	-	-	86.1	88.2	88.8	-	8.45	-	-	13.7	7.9	-	-	140.0	81.0
-	3(.)M 65-160/9.2	9.2	12.5	-	IE2	-	-	88.6	90.0	89.9	-	10.23	-	-	16.8	9.7	-	-	166.0	96.0
-	3(.)M 65-160/11	11.0	15.0	-	IE2	-	-	88.9	90.3	90.2	-	12.20	-	-	21.9	12.7	-	-	186.0	108.0
-	3(.)M 65-160/15	15.0	20.0	-	IE2	-	-	89.3	91.0	91.1	-	16.47	-	-	28.3	16.4	-	-	246.0	143.0
-	3(.)M 65-200/15	15.0	20.0	-	IE2	-	-	89.3	91.0	91.1	-	16.47	-	-	28.3	16.4	-	-	246.0	143.0
-	3(.)M 65-200/18.5	18.5	25.0	-	IE2	-	-	89.8	91.2	91.7	-	20.17	-	-	36.3	21.0	-	-	325.0	188.0
-	3(.)M 65-200/22	22.0	30.0	-	IE2	-	-	89.9	91.9	92.4	-	23.80	-	-	40.8	23.7	-	-	383.0	222.0
-	3LM 80-160/11	11.0	15.0	-	IE2	-	-	88.9	90.3	90.2	-	12.20	-	-	21.9	12.7	-	-	186.0	108.0
-	3LM 80-160/13	13.0	17.5	-	IE2	-	-	89.3	91.0	91.1	-	16.47	-	-	28.3	16.4	-	-	246.0	143.0
-	3LM 80-160/15	15.0	20.0	-	IE2	-	-	89.3	91.0	91.1	-	16.47	-	-	28.3	16.4	-	-	246.0	143.0
-	3LM 80-160/18.5	18.5	25.0	-	IE2	-	-	89.8	91.2	91.7	-	20.17		-	36.3	21.0	-	-	325.0	188.0

NOISE DATA 3(.)M

Pump type		Power		L_{pA} - dB(A) *
Single Phase	Three Phase	[kW]	[HP]	
3(.)M 32-125/1.1 M	3(.)M 32-125/1.1	1.1	1.5	<70
3(.)M 32-160/1.5 M	3(.)M 32-160/1.5	1.5	2.0	
3(.)M 32-160/2.2 M	3(.)M 32-160/2.2	2.2	3.0	
-	3(.)M 32-200/3.0	3.0	4.0	71
-	3(.)M 32-200/4.0	4.0	5.5	
-	3(.)M 32-200/5.5	5.5	7.5	75
-	3(.)M 32-200/7.5	7.5	10.0	
3(.)M 40-125/1,5 M	3(.)M 40-125/1.5	1.5	2.0	<70
3(.)M 40-125/2.2 M	3(.)M 40-125/2.2	2.2	3.0	
-	3(.)M 40-160/3.0	3.0	4.0	71
-	3(.)M 40-160/4.0	4.0	5.5	
-	3(.)M 40-200/5.5	5.5	7.5	75
-	3(.)M 40-200/7.5	7.5	10.0	
-	3(.)M 40-200/11	11.0	15.0	80
3(.)M 50-125/2.2 M	3(.)M 50-125/2.2	2.2	3.0	<70
-	3(.)M 50-125/3.0	3.0	4.0	71
-	3(.)M 50-125/4.0	4.0	5.5	
-	3(.)M 50-160/5.5	5.5	7.5	75
-	3(.)M 50-160/7.5	7.5	10.0	
-	3(.)M 50-200/9.2	9.2	12.5	80
-	3(.)M 50-200/11	11.0	15.0	
-	3(.)M 50-200/15	15.0	20.0	
-	3(.)M 65-125/4	4.0	5.5	71
-	3(.)M 65-125/5.5	5.5	7.5	75
-	3(.)M 65-125/7.5	7.5	10.0	
-	3(.)M 65-160/7.5	7.5	10.0	
-	3(.)M 65-160/9.2	9.2	12.5	80
-	3(.)M 65-160/11	11.0	15.0	
-	3(.)M 65-160/15	15.0	20.0	
-	3(.)M 65-200/15	15.0	20.0	
-	3(.)M 65-200/18.5	18.5	25.0	83-82
-	3(.)M 65-200/22	22.0	30.0	
-	3LM 80-160/11	11.0	15.0	80
-	3LM 80-160/13	13.0	17.5	
-	3LM 80-160/15	15.0	20.0	
	3LM 80-160/18.5	18.5	25.0	83-82

* Mean value of several measures at 1m distance around the pump.
Tolerance ± 2.5 dB.

IT

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N° di Matricola - Serial Number Seriennummer - N° de Matricule N° de Matrícula	

SERVIZIO ASSISTENZA

Per qualunque richiesta di informazioni, interventi etc. è sempre necessario comunicare il NUMERO DI MATRICOLA della macchina.
Non è possibile fornire istruzioni precise o programmare interventi senza che sia fornito questo dato.
Il numero di matricola è anche stampigliato su una apposita targhetta fissata sulla macchina.

ASSISTANCE SERVICE

For any request regarding information, service, etc., it is always necessary to indicate the SERIAL NUMBER of the machine.
It is not possible to provide precise instructions or schedule servicing unless this information is communicated.
The serial number is printed on the plate fixed to the machine, too.

KUNDENDIENST

Bei allen Anfragen um Informationen, Eingriffe usw. stets die SERIENNUMMER der Maschine angeben.
Ohne diese Angabe können keine exakten Informationen geliefert und keine Eingriffe geplant werden.
Die Seriennummer ist auch dem Typenschild auf der Maschine zu entnehmen.

SERVICE ASSISTANCE

Pour toute demande d'informations, d'interventions, etc., il faut toujours indiquer le NUMERO DE MATRICULE de la machine.
Il est impossible de fournir des instructions précises ou de programmer des interventions sans cette donnée.
Le numéro de matricule est estampillé aussi sur la plaquette fixée sur la machine.

SERVICIO DE ASISTENCIA

Para cualquier solicitud de información, de intervenciones u otros servicios, indicar siempre el NÚMERO DE MATRÍCULA de la máquina.
Es imposible suministrar indicaciones precisas o programar intervenciones sin este dato.
El número de matrícula se encuentra impreso también en una placa especial aplicada a la máquina.

DELLA TOFFOLA

Numero Verde
800-803276

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